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# QUEENSLAND AGRICULTURAL JOURNAL

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## Event and Comment.

### The Current Issue.

Observations on the State's agricultural progress and problems, which were embodied in the Speech of His Excellency the Governor at the opening of Parliament, will be read with interest. The stud pigs purchased by the Government in the South recently are well described and illustrated. An article on the dentition of the pig contains some very useful information. The activities of the Bureau of Sugar Experiment Stations are also featured strongly. There are some very useful notes on the economic value of certain Queensland parasitic insects. There is also an interesting account of some of the means adopted by the Prickly-pear Commission in combating the pear pest. Maize growers will be interested keenly in a reprinted article on the feeding value of maize grain.

### Ratoon Cotton.

The Government has decided, pending the passing of amending legislation, not to enforce the provisions of the Cotton Industry Act prohibiting cotton ratooning. In making this announcement the Minister for Agriculture (Hon. W. N. Gillies) made it clear that growers will be allowed to ratoon this year's annual cotton, provided the shrubs are cut back to 6 in. above the ground before 15th September. Permission to ratoon applies only to annual plants, that is to say that all ratoon plants now in existence must be totally destroyed. The cultivation of second ratoons is absolutely prohibited. Pruning must be completed by 15th September, and growers intending to ratoon this season's plants must notify the Department immediately. Cuttings accumulated in the process of ratooning must, together with all other cotton-field debris, be destroyed totally by fire by the same date. This also applies to cotton plants which growers do not intend to ratoon. It is not proposed that the relaxation of the ratooning restrictions shall mean that cotton shall not continue to be subject to a "close season." The necessity of keeping cotton fields thoroughly clean as a precaution against pests cannot be ignored. The Government guarantee will not apply to ratoon cotton next year, but it may be ginned at authorised ginneries. It has been decided to gin and market ratoon cotton separately, and if, after meeting all charges, there is any surplus above the amount advanced against the consignment on its receipt at the ginnery, as with annual cotton, it will be returned *pro rata* to the ratoon suppliers. Ratoon cotton must be harvested and bagged separately. The

bags must be labelled "Ratoon." The mixing of annual and ratoon cotton in the one container is absolutely forbidden, and heavy penalties are provided for anyone found guilty of so doing. Insistence will be made on the observance of the existing stipulation that all seed for cotton-growing must be obtained through the Department of Agriculture. Legislative provision for the registration of cotton growers already exists, and this provision will be strengthened in the amending Bill to be introduced this session by making the possession of a license by the grower essential.

### Turning a New Furrow.

The Education Department is turning a new furrow in the field of rural instruction. At the Nambour Rural School a course of instruction in the care, repair, and use of farm implements and machinery, including motor vehicles, is about to be instituted. Milking machines, power plants, and motors are coming into such general use that a knowledge of mechanics is becoming a necessity to the farmer. The principle behind the Rural School classes is to enable the sons of farmers to be self-reliant when they undertake the duties of life. The maintenance of machinery in a proper manner at a minimum of expense is the aim of the new classes. For the present, students in the new course will be limited to those attending the Rural School who have passed through or are attending courses in blacksmithing, plumbing, or woodwork. Consideration will be given later to arranging evening classes in motor mechanics for past students of the school.

### The Country Women's Association.

The aims of the Country Women's Association—the making of life more pleasant for country women, and the extension of bush nursing homes and book clubs—are such as to heartily commend themselves to all interested in the lives of inland dwellers. Included in the activities of the Association is the establishment of seaside bungalows in which country women may secure all the comforts of a pleasant holiday at the minimum of expense. The first of these coastal social centres was opened recently at Lota, near Manly, overlooking beautiful Moreton Bay. Speaking at the opening ceremony, His Excellency the Governor, Sir Matthew Nathan, remarked that the Country Women's Association had set high aims and ideals before the community. The Lota Home represented one of the first concrete results of the country women's efforts. With the wish that in the home many Western wives would find health and rest, and happiness in all its childish forms to scores of their little ones, he declared the home opened. In the course of further remarks Sir Matthew Nathan said that an enormous area of Western and Downs country and a large proportion of the rural population of Queensland would have to be served by seaside homes on the coast to the north and south of Brisbane if the purpose to make possible a seaside holiday to the people in the interior, who could not otherwise manage to get it, was to attain complete fruition. The general purpose would be helped on by the Country Women's Association's appeal now being made. A first response to the appeal had been the presentation by a generous family, in affectionate memory of a lost member, of the convenient and pleasantly situated property which was being dedicated that day. Very wisely those who had in hand the arrangements for its occupation had decided to proceed with these without awaiting the considerable enlargement and additional equipment necessary to make it fully adequate to the requirements of the first seaside home under the scheme. It was their hope that the home would be soon available for the families of the workers in the back country, without whom the city would be a small thing and the State have no prospect of advancement.

### Young Judges at the Brisbane Show.

The six classes in the young judges' competitions at the Brisbane Show have attracted sixty-seven young men, who hail from all parts of Southern Queensland and the Northern Rivers district of New South Wales. The interest evinced in this commendable section of the show demonstrates clearly the good work the National Association is doing in encouraging young men to study the art of judging. Beneficial results undoubtedly will accrue from these competitions, as in the course of years competent judges will be provided within Queensland to determine the prize winners in the various shows held throughout the State. From the Queensland Agricultural High School and College, Gatton, twelve competitors have come, and the balance is drawn from the well-known dairying centres of Toogoolawah, Gatton, North Coast centres, parts of the Upper Burnett, Tweed Heads, and students from the Central Technical College. Most of them are sons of successful herd book dairy breeders, and for this reason should be well schooled in the tests required.

# QUEENSLAND AGRICULTURE.

## ITS PROGRESS AND PROBLEMS.

The Speech of His Excellency the Governor (Right Hon. Sir Matthew Nathan, P.C. (Ire.), G.C.M.G.) at the opening of the Second Session of the Twenty-third Queensland Parliament on 29th July contained the following references to the State's agricultural progress and problems:—

### The Sugar Industry.

During the year, production in the sugar industry was greater in the northern area than ever previously recorded, though south of Townsville the crushing was below the estimate. The tribunal appointed under the arrangement with the Commonwealth Government has fixed the price of raw sugar for the current season at £27 per ton, but the Sugar Pool Board will not be able to pay the full price of £27 per ton to the millers, owing to the loss which is anticipated in finding an export market for the surplus production. As the present arrangement between the Federal and State Governments in respect of the marketing of the sugar crop will expire in 1925, some anxiety exists as to the policy of the Commonwealth Government for the future.

My advisers believe the present arrangements for the protection of the sugar industry is the best that could be devised. The embargo against the importation of sugar, except in the case of a shortage in the Australian production, and the regulation of the prices of cane, raw sugar, and refined sugar, ensure equitable treatment for all concerned, and are a much more satisfactory form of protection than any that could be afforded by the enactment of a fixed tariff.

If the Commonwealth Government consent to a continuation of the existing arrangement, legislation will be introduced in the Queensland Parliament for the purpose of defining more clearly the authority and obligations of the Sugar Pool Board.

### The Dairying Industry.

The dairying industry, despite adverse seasons, is making steady progress in this State, which bids fair to become the premier dairying State of the Commonwealth. The area under artificial grasses has increased from 205,000 acres to 475,000 acres during the last ten years, an increase of 130 per cent.

Co-operative control by the farmers of manufacture in the dairying industry has made more rapid strides in Queensland than in any other State. Although co-operative control of marketing has been discussed for many years, it is only now that the matter is being taken up seriously and earnestly by those concerned.

### Council of Agriculture.

The Council of Agriculture, after having been equipped with all the legislative powers the State can provide, have recognised that the problem cannot be solved without the co-operation of the Commonwealth and the other butter-producing States. The council, after making a comprehensive investigation into the question of production and marketing, convened an interstate dairying conference, and placed before that conference a scheme for interstate and oversea marketing, which was endorsed by the interstate delegates. This scheme is now the subject of negotiations with the Federal Government.

### Fruit Marketing.

The year has seen a marked advance in the organisation of the fruitgrowers towards mutual help and protection. A large proportion of the fruitgrowers accepted the scheme put forward by the Council of Agriculture for the compulsory co-operative marketing of fruit. A special Act of control was passed last session to give effect to this policy, and although, like all rapid changes, the scheme was criticised for a time through the Press, the Fruit Marketing Committee, elected by the growers themselves, are succeeding in the work they were intended to do under the Act, and the more regulated marketing of fruit and the bringing of the producer and the consumer more closely together will result in a benefit to the community as a whole.

### The Cotton Industry.

The cotton industry continues to advance despite the dry weather and numerous insect pests, although, owing to these causes, the yield per acre in many districts was not as good as might be wished. The harvesting season for seed cotton has been extended to meet the conditions of the season. The total yield is expected to reach 15,000,000 lb. of seed cotton. The outbreak of the pink boll-worm, which has been so destructive to cotton crops in other parts of the world, emphasises the wisdom of passing special legislation to insure the whole of the cotton stalks and debris being destroyed every year, and to provide a close season. Special precautions have been taken in the field and also to insure the effective treatment of seed prior to its being planted. The necessary apparatus has been installed for this purpose. The Commonwealth Government have imposed most rigid conditions regarding the importation of cotton seed.

The Durango variety of cotton, which produces a good crop and has proved to be of high value for spinning purposes, has been planted wherever possible, and for the 1924 planting it is estimated that sufficient seed will be available to plant 10,000 acres, and the following year there will be sufficient seed to meet all demands.

The conditions under which the Government are prepared to relax the embargo on the growing of ratoon cotton having been agreed to by the growers, through their delegates at a conference under the auspices of the Council of Agriculture, a Bill will be introduced to amend the Cotton Industry Act in the direction indicated.

### The Queensland Producers' Association.

The several units in the scheme of agricultural organisation—namely, local producers' associations, district councils, and the Council of Agriculture—have settled down to their respective functions under the Act and are doing good work. There are 756 local producers' associations, with a membership of 23,000.

### North Queensland Maize Pool.

In the Atherton district, granaries are being erected at a cost of approximately £70,000, the money being advanced by the Government to the Northern Queensland Maize Pool Board. These granaries are capable of holding about 400,000 bushels of maize, and the scheme provides for the latest drying and cleaning equipment. The completion of these granaries, which is expected in a few weeks' time, will enable the farmers to clean, dry, and store their crop, and thus regulate the supply and stabilise the price. It is believed, as a result of this scheme, that the area under maize will be considerably increased.

### New Settlement.

The first section of 1,400 portions in the Upper Burnett and Callide Valley areas was made available for selection at the end of November last year. Already 650 portions have been allotted to new settlers, and a good proportion of these are now in occupation and are making improvements and preparing the land for cotton-growing, dairying, and general farming. The second section of the scheme, comprising about 1,400 portions, has been designed for selection and will probably be made available at the end of the year.

In the Clermont and Capella districts, sixty-one portions, ranging in area from 1,000 to 2,560 acres each, will be opened for perpetual lease selection towards the end of the year. The country is suitable for cotton-growing combined with dairying and sheep-raising. During the year an area of about 1,000,000 acres from pastoral holdings has been resumed for closer settlement.

The demand for rabbit and dog netting continues to increase, and my advisers are encouraging the enclosure of holdings in groups wherever possible.

### Main Roads.

The operation of the Main Roads Board were continued during the year, and approximately 110 miles of road, including bridges, have been completed and thrown open, and about 150 miles are now under construction.

### The Prickly-pear Problem.

My advisers have taken definite action to cope with the prickly-pear problem. A commission of three members has been appointed, which will exercise all the functions of the Land Court throughout the areas infested with prickly-pear, and also all administrative functions in respect of such lands. Poisons for the eradication of pear are being supplied to settlers at cheap rates, while the State Government is co-operating with the Commonwealth Government in carrying out biological experiments and research. It is anticipated that shortly a system of "buffer areas" will be proclaimed, and that by the activities of the commission the devastating spread of pear in this State will be stopped.

### Forestry.

The classification, valuation, and survey of the Crown timber lands have been pushed on during the year. By the addition of 76,000 acres, the Crown forest area was increased to 4,800,000 acres. The past alienations of the forest resources are having a bad cumulative effect upon the life of the important timber industry of the State. It has been necessary to adopt careful measures in order to assure to the sawmills a sufficient supply of pine logs. The Forest Service has increased its pine-log output from 35,000,000 super. feet in 1918 to 44,000,000 super. feet in 1923 in its endeavour to cope with the situation. Careful technological researches have been made into the economic value of the 400 or 500 distinct tree species which are found in the forests of the State.

### The Dawson Irrigation Project.

Satisfactory progress has been made on the Dawson Valley irrigation scheme, where the work is proceeding according to schedule. During my recent visit of inspection to the area, the pumping plant and electric power-house were opened by me, and the first water sent through the distributary channels on part of the preliminary 5,000 acres of irrigated lands. It is confidently anticipated by the Commissioner of Irrigation that the 5,000 acres will all be thrown open for occupation by December next.

The great work of damming the Dawson River, which is to follow on this preliminiary irrigation project, is destined to play a prominent part in the future land settlement of the State, and is in every sense a truly national undertaking. Fodder grown on the irrigation area could be transported throughout the State in periods of drought, avoiding stock losses and stabilising rural industries. Thus the scheme, apart from settling thousands of families on farms, provides an insurance against losses during the droughts of the future.

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## QUEENSLAND TREES.

By C. T. WHITE, F.L.S., Government Botanist, and W. D. FRANCIS, Assistant Botanist.

*Sideroxylon Pohlmanianum* does not appear to have a common popular name. The species is found on the Tweed River, in New South Wales, and is fairly common in many of the "scrubs" or rain forests of Queensland from the Southern border to Cairns in the North. The bark when cut exudes a milk-like sap. The fruit is black and somewhat plum-like, about 1 inch in diameter, and contains from two to five very hard, smooth seeds. The timber is pale in colour and has the appearance of pine, but is heavier. It should be useful for cabinet-making and general indoor work. The writers have noticed that the trees are common in some of the drier scrubs, such as those in the Nanango district, although it is also found in the more luxuriant rain forests of the North Coast line.

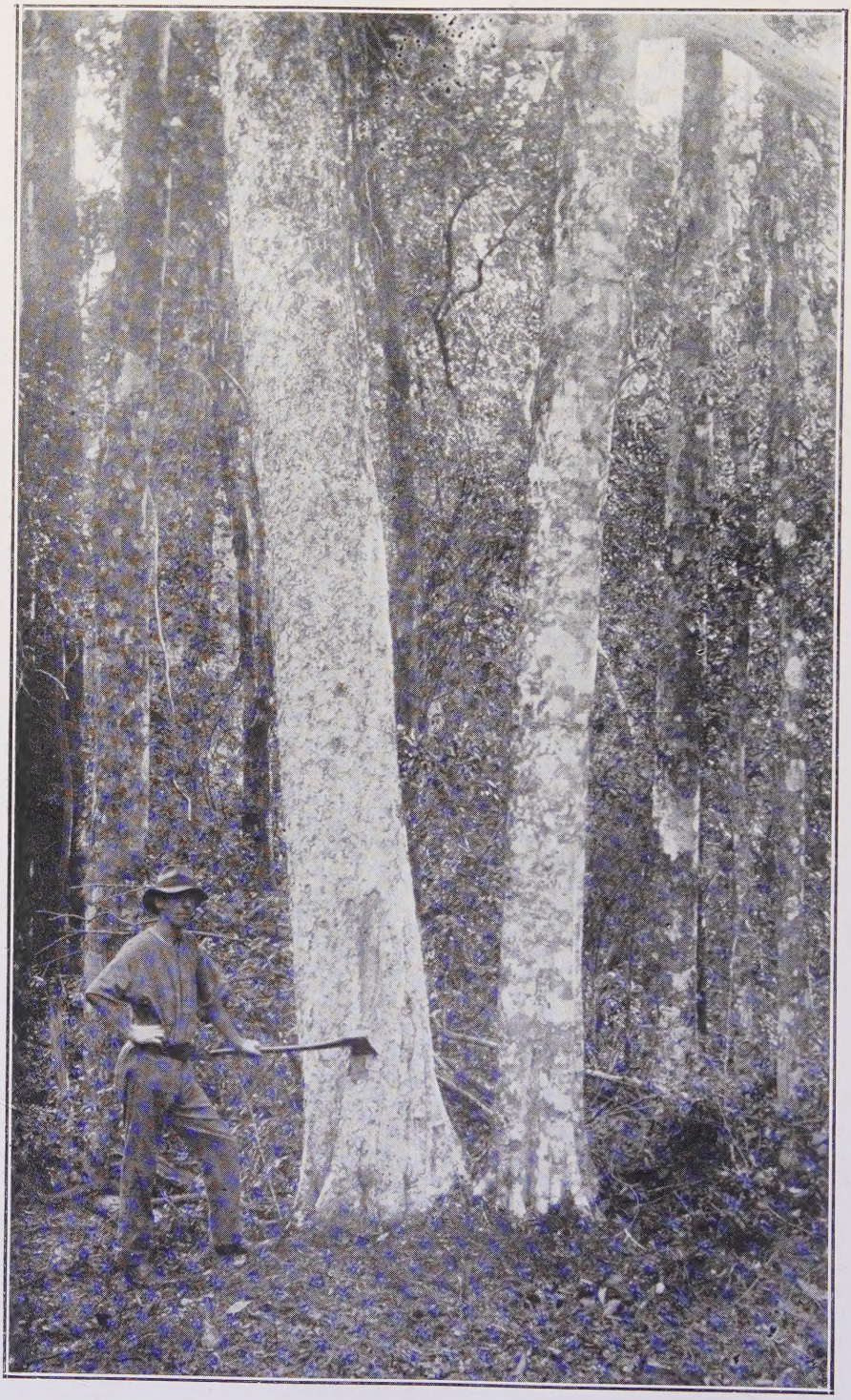

*Photo. by Authors.*]

PLATE 23.—SIDEROXYLON POHLMANIANUM, A TREE IN THE SCRUB NEAR NANANGO. The tree on the right hand side of the picture is *Cupania anacardioides* var. *parvifolia*.

Plate 24.—Sideroxylon Pohlmanianum.

# STUD PIGS FOR QUEENSLAND.

## NEW BLOOD INTRODUCED.

Acting under instructions from the Minister for Agriculture (Hon. W. N. Gillies), the Instructor in Pig Raising (Mr. E. J. Shelton, H.D.A) attended the Royal Agricultural Show at Sydney for the purpose of making extensive purchases of stud pigs for the several Government Institutions in this State.

A very careful selection has been made, and some really choice breeding stock introduced as a result of this visit, and it is hoped later to have available for sale the progeny of these selected animals at reasonable prices, so that farmers throughout the State may have an opportunity of securing fresh blood for their piggeries.

Inquiries as to the stock available, or for information regarding the purchases, should be addressed to the Managers of the State Farms at Kairi, N.Q., and Warren; to the Principal of Gatton College, T.P.O. South, and to the Medical Superintendent at Dunwich.

Detailed particulars of the pigs purchased are as follow:—

### Berkshires.

*Account Manager, State Farm, Kairi, viâ Cairns, North Queensland.*

Berkshire Boars: "Bylands Tarboy" and "Brentwood Bylands."

Berkshire Sows: "Hazelbrook Lady" 5744, "Wilcannia Lilian," "Bylands Lassie," and "Parramatta Peg."

Of these, the boar, "Bylands Tarboy," was from a prominent prize-winning family in one of the largest classes in the show. His sire won second prize in Aged Berkshire Boar class, same show; his dam winning second prize in Aged Berkshire Sows—also a heavily contested class. The stud from which this boar comes is a noted one—viz., John Crane, of Nathalia, Victoria. He had a reserve of 75 guineas on the dam of "Bylands Tarboy," and considered her one of the best breeding sows in Australia.

The boar, "Brentwood Bylands," was selected from the first prize pen of boars under four months. His parents are well known prize winners at Southern Shows.

The sow, "Hazelbrook Lady" 5744, is sired by that old champion, "Bylands Pat" 1955; the dam's breeding traces back to "Empire Day," an unbeaten champion at Sydney and Melbourne Shows, a boar for which an offer of 100 guineas was refused.

The dam of the sow, "Wilcannia Lilian," took second prize, with litter, Sydney, 1923; first, with litter, Tongala, Victoria, 1921; first and champion, same show, 1922. She is the dam of "Wilcannia Agnes," second prize sow under nine months, Sydney, 1923, and first prize under fifteen months, Melbourne; also first and champion, Grand National Show, Victoria, 1923. Her granddam, "Renrow Lily," won first prize, Melbourne, 1918; also first, Tatura, Victoria. The sire of "Wilcannia Lilian's" dam, "Pendennis Bill" 2554, won first and champion, Tongala, Victoria, 1921. He was by "Brigadier" 1107, champion, Melbourne, 1916 and 1917. "Wilcannia Lilian's" sire, "Fashion Plate" 3916, won second, Ballarat; first and champion, Tongala, 1922. He was the sire of the winning boar, "Melbourne Royal" 1922, a boar which at under four months old sold for 35 guineas. He was sired by "Lord Wallace" 3915, by "Stephenhurst Mac" 2309, dam "Gippsland Poppy 2241, by "Empire Day" 741, reserved champion, Melbourne, 1914; champion, Sydney, 1914; champion, Korumburra, 1915; champion and herd-book ribbon; also first prize for best boar for producing bacon pigs, Sydney, 1915.

The sow, "Bylands Lassie," is a full sister to the boar, "Bylands Tarboy." The sow, "Parramatta Peg," has for her sire the first-prize boar, Sydney, 1923, "Conargo Major," 4221, who sold for 40 guineas at public auction.

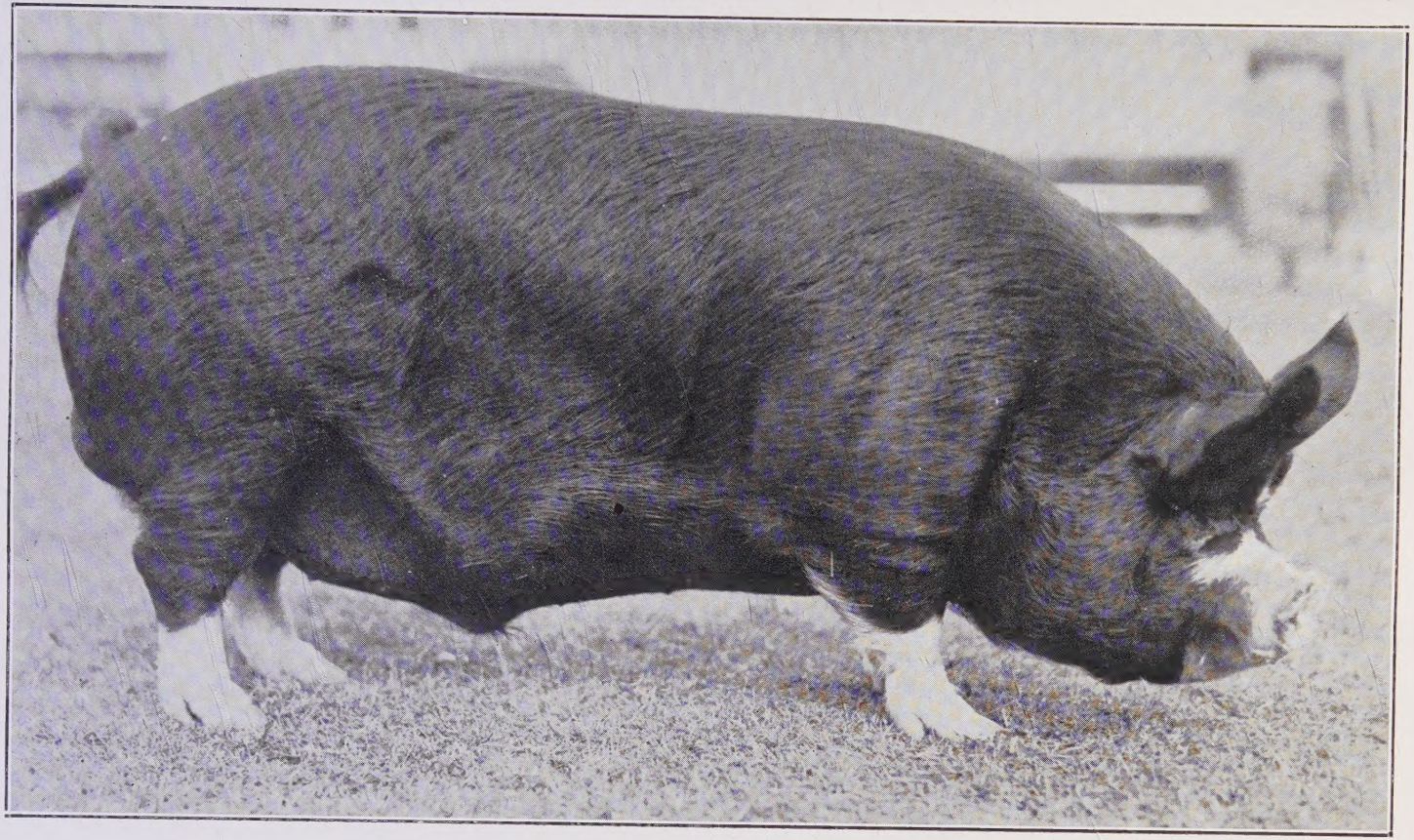

PLATE 25.—CHAMPION BERKSHIRE BOAR, "MURRAY GLEN STAR" 4969.

Purchased for the Queensland Agricultural High School and College, Gatton, at 50 guineas. This Boar has been a consistent prize-winner, and comes from a long line of prize-winning Berkshires. His sire, "Murray Glen Longfellow" 3681, has sired many champions. The strain is a well-known Victorian line of blood.

**Berkshires.**

*Account Manager, State Farm, Warren, viâ Rockhampton.*

Berkshire Boars: "Brentwood Beau" and "Wilmot Ron."

Berkshire Sows: "Danesboro Model," "Pigeon Grove Stella," "Bylands Bessie," and "Dundas Rosaleen."

Of these, the boar, "Brentwood Beau" 5559, was also a prize winner. His sire, "Bylands Boomer," is well known. He secured second prize in the Aged Berkshire class, beating last year's Melbourne champion. His strain have been much sought after in recent years. The boar, "Wilmot Ron," was bred in Tasmania by Norman Williams, Esq., of Wilmot. Mr. Williams has been very successful with his stud—a full brother to "Wilmot Ron" having realised 67 guineas at Sydney Show three years ago, after having won the Blue Ribbon there.

Of the sows, "Danesboro Model," represents the same class of blood. She won first and champion prizes both at Penrith and Blacktown Shows, 1924. She should develop into a prominent prize winner here. The sow, "Pigeon Grove Stella," won first prize in a very heavily contested class at Sydney Show this year. She had also won prizes at previous shows in New South Wales, and had been secured specially for exhibition at Sydney. She has since been mated to the champion boar, "Murray Glen Star," at Gatton. The sow, "Bylands Bessie," is a full sister to the boar, "Bylands Tarboy," sent to Kairi. The sow "Dundas Rosaleen" also comes from a very prolific and profitable line of blood, noted for early maturity. Her dam won third prize at Sydney Show, 1923, whilst full sisters and brothers were prominent prize winners. "Rosaleen" was one of the third prize pen of sows under four months, Sydney, this year. The Warren consignment should do much to popularise the Berkshire in Central Queensland, where pig-breeding is now recognised as a payable industry.

**Berkshire, Tamworth, and Poland-China Boars and Sows.**

*Account Queensland Agricultural High School and College, Gatton.*

Berkshire Boar: "Murray Glen Star" 4969.

Berkshire Sows: "Bylands Lancy" 5238 and "Killarney Stella" 4249.

Tamworth Boars: "Danesboro Fred" 407 and "Blakeney Rex" 332.

Tamworth Sows: "Hawkesbury" sow (2092 H.A.C.), "Manning Juliet" 306, "Rosebank Rosy Queen" 113, "Blakeney Rose," "Orara Lass," "Oban Miss" 324.

Poland-China Boar: "Homeville Duke" 124.

Poland-China Sow: "Danesboro Winnie" 130.

Of this consignment, the Berkshire boar, "Murray Glen Star" 4969, was the champion Berkshire boar of the Show, and was purchased at 50 guineas to head the Gatton stud of Berkshires. He comes from a line of blood well known throughout Victoria and New South Wales as consistent prize-winning stock. He also won first and champion at Penrith and Blacktown Shows, New South Wales, 1923. He had to compete against several ex-champions at Sydney this year, including Mr. E. M. Lennie's "Wilcannia Special," a remarkably good boar, for which 60 guineas was refused at the show.

The sow, "Bylands Lancy," was forward in pigs to Berk. boar "Bylands Senator" 5233, a well-known prize winner. Her sire, "Bylands Boomer" 4509, won second prize in aged Berkshire class, Sydney, 1924, whilst her dam, "Bylands Tassy" 4508, won third prize in the aged Berkshire sow class, same show. She should prove a valuable addition to the stud, and, as she has farrowed since arrival at Gatton, her litter should go a long way towards paying for her. The sow, "Killarney Stella" 4249, won first prize, Sydney, 1924, in class Berkshire sow with litter at foot. She was rearing eleven fine pigs at time of show. These were selling freely at up to 10 guineas each. Her sire is a son of the imported Berkshire boar, "Sutton's Improver" 1437, a boar which cost over 200 guineas, landed in Sydney, and coming from one of the most successful studs in America.

The Tamworth boar, "Danesboro Fred" 407, was one of the first prize pen of three Tamworth boars under four months at Sydney Show, 1923. He subsequently won first and champion prize at Penrith Show, and first prize at Blacktown Show, New South Wales, 1923, and second in Tamworth boar over fifteen months, Sydney Show, 1924. His parents have won numerous prizes at Manning River shows, New South Wales, including first prize Wingham Show, New South Wales, 1924, awarded to his dam, second prize same show to his sire, one of whose sons also won first prize, same show. The boar, "Blakeney Rex" 332, won first prize Sydney, 1924, in class for Tamworth boar under nine months. His parents also are prominent Manning River prize winners.

PLATE 26.—BERKSHIRE BOAR, "CARAVALE MAJOR" 5580. FIRST PRIZE BOAR, UNDER 15 MONTHS, SYDNEY SHOW, 1924.

This boar was in the best of company and at the stud sales realised 42 guineas. He also gained Second Prize, Melbourne Royal Show, 1923, in the best aggregate old class, which was heartily contested. He also secured First Prize, Newmarket Show, Victoria. His full sister gained First Prize, Melbourne Show, 1922. His son, "Coolabilee Nugget" 2476, was Champion at the Brisbane Show, 1923.

PLATE 27.—CHAMPION BERKSHIRE SOW, SYDNEY SHOW, 1924. G. R. LOBBERS'S "CUNARD TOPSY" 4258.

This sow was submitted to public auction, but finally the owner withdrew her from sale. Her reserve price was in the vicinity of 175 guineas. She represents a very prepotent up-to-date type of Berkshire, which sought after at Southern Shows. One of her sons, "Cunard Skipper" 5737, was purchased for the Dunwich Hospital, Queensland.

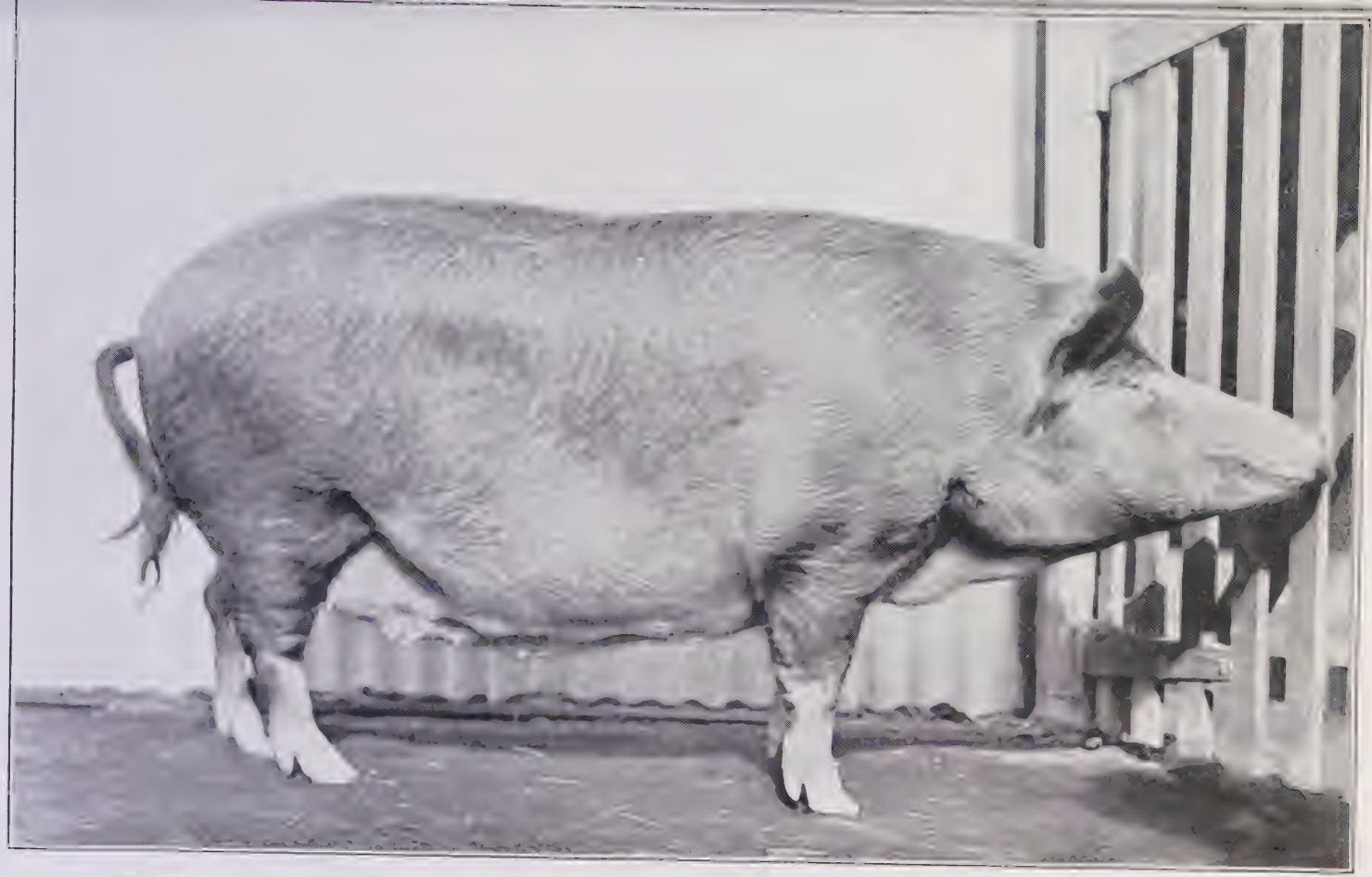

PLATE 28.—CHAMPION TAMWORTH SOW, SYDNEY SHOW, 1924. MRS. TINDALE'S "ROSEBANK ROSY QUEEN" 113.
This sow was purchased for the Gatton College stud. She was bred at the Hawkesbury Agricultural College, New South Wales, and is a direct representative of their imported strains.

Of the sows, the sow "Hawkesbury" 2092 was selected from the Hawkesbury College stud. She comes directly from imported parentage. The sow, "Manning Juliet" 306, was heavy in pig at the time of purchase, and has since farrowed a satisfactory litter. She won a first prize Taree Show, 1924. Her full sister won first prize, Sydney Show, 1923, and first and champion at Coramba Show, same year.

The sow "Rosebank Rosy Queen" 113 was the champion Tamworth sow, Sydney, 1924. She won second prize in class sow over fifteen months, Sydney, 1923. She was bred at the Hawkesbury College stud. The sow "Blakeney Rose" won first prize, Sydney, 1924, in a heavily contested class, the sow, "Orara Lass," being the second-prize sow in same class. "Oban Miss" was also a runner-up in this class, she being by "Grange Dalkeith" 220, a Camden Park Estate boar.

The Poland-China boar, "Homeville Duke" 124, won first prize in his class, Sydney, 1924. His full brother won second prize, same class, whilst full sisters and brothers won numerous prizes at Sydney at both 1923 and 1924 shows. The sow, "Danesboro Winnie" 130, was the first prize sow with litter, Sydney Show, 1924, and is a high-class animal. A number of her litter were secured, as also were some other prize-winning Polands for the stud of Mr. J. H. Whittaker, of Broxburn, Darling Downs, Queensland, these pigs travelling to Queensland with same consignments as referred to in this article.

## Berkshire Boar and Sows and Tamworth Boar and Sows.

*Account Medical Superintendent, Dunwich Hospital, Queensland.*

Berkshire Boar: "Conargo Skipper" 5737.

Berkshire Sows: "Dundas Madge" and "Margaret," "Wilmot Rene" and "Parramatta Queen," and "Joyce."

This consignment of Berkshires is now located at Dunwich Hospital, Stradbroke Island, and forms the nucleus of a new stud at that Institution. The Berkshire boar, "Conargo Skipper" 5737, is a son of the champion Berkshire sow, "Conargo Topsy" 4228. This sow was reserved at the stud sales at 120 guineas. She also won first and champion, Sydney Show, 1921, first prize for group consisting of Berkshire sow and three of her female progeny, Sydney Royal, 1924; also special first prize as one of a group of five best Berkshire pigs on the ground, same show. "Conargo Skipper's" sire, "Conargo Dick," is also a very successful stud animal, and has been of great value in building up the herd from which he comes—that of G. R. Limbrick, of Langunga, New South Wales. The sows "Dundas Madge" and "Margaret" were two of the pen winning third prize under four months, Sydney, 1924. They come from the stud of Charles Dawson, of Dundas, New South Wales, a man who has proved that there is a decent living for a man in running a dozen or more sows on a small holding, and collecting refuse food from hotels, cafés, &c. These sows were well developed, and should make up into fine breeders. The sow "Wilmot Rene" was bred in Tasmania, from which State she came to the Sydney Show. Her parents are consistent prize winners there, a boar from this stud a couple of years ago realising 65 guineas at the Sydney Show. The sows "Parramatta Queen" and "Joyce" were bred at Parramatta Hospital, New South Wales. For further reference to their prize records, &c., see details of pigs sent to Kairi State Farm, they being full sisters to "Parramatta Peg."

In Tamworths, Dunwich Hospital secured as fine a lot as has ever been introduced to this State, and as the nucleus of a Tamworth stud now being developed at this hospital would be hard to beat. The boar, "Blakeney Ross," won first prize Sydney Show, 1924, and is developing into a champion. His dam, "Pampoolah Ruby," has produced many prize winners. She was the second prize sow in aged Tamworth sow class, same show, and is included in the purchase of sows for Dunwich.

Two sows, "Hawkesbury" 2091 and 2093, were included. They came from the Hawkesbury College stud, and are really choice animals, specially selected and of the modern type. Two sows, "Orara Goodhope" 253 (who has since farrowed eight healthy good-type pigs) and "Orara Sunbeam" 309 (also now rearing her litter), from the stud of C. J. Franks, of Coramba, New South Wales, should also prove themselves specially suited to the conditions at Dunwich, where they will be mated with the boar referred to above at an early date.

Another sow, "Winburndale Sedate" 326, the second prize sow Sydney, 1924, from the stud of Mr. F. Ebbern, of Raglan, New South Wales, is a very useful type and should prove a great breeder. The sixth sow was "Pampoolah Ruby" 145, referred to above.

Young stock from these animals will be available at a later date at Dunwich Hospital, and particulars regarding these can be obtained from the Medical Superintendent at any time.

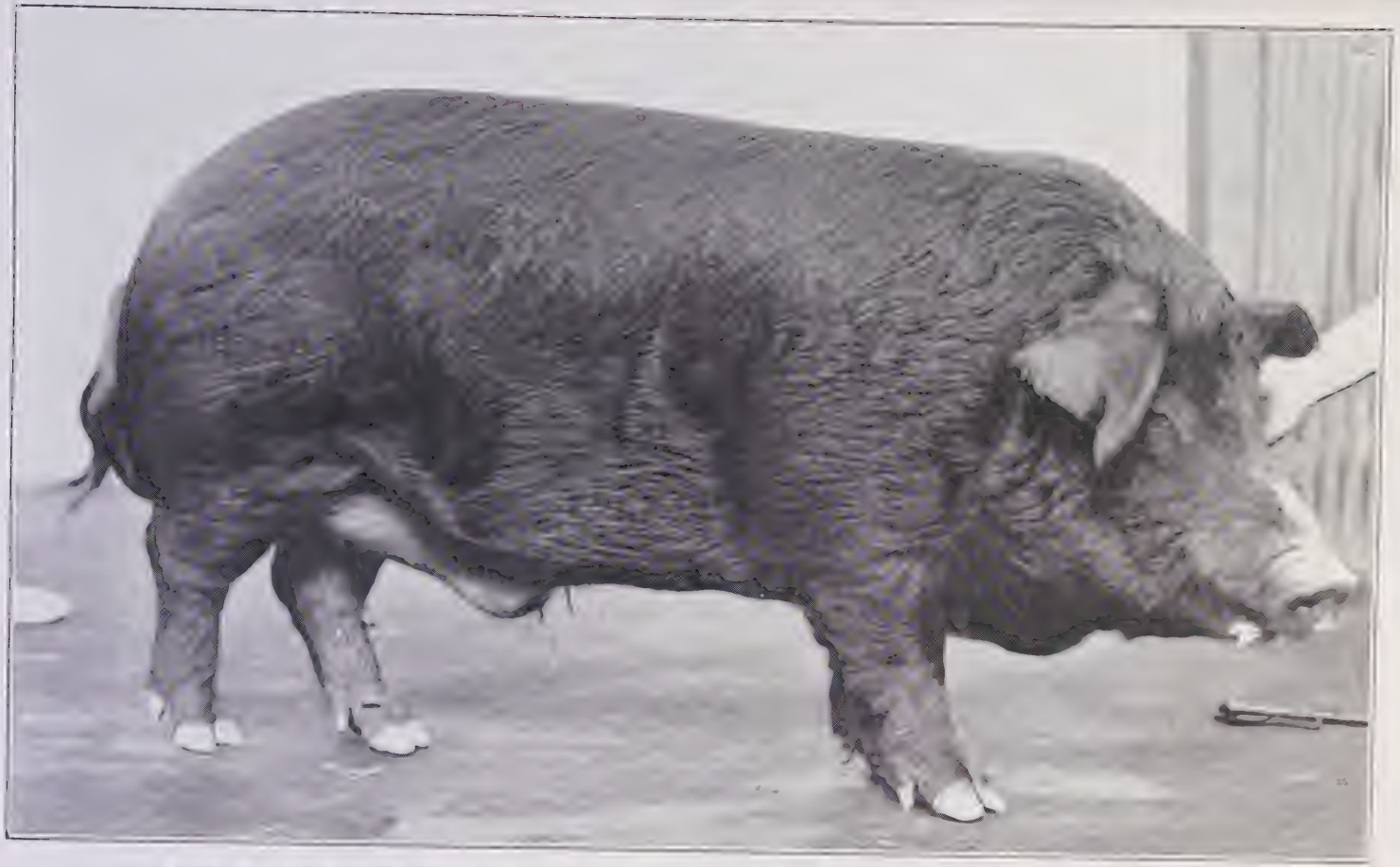

PLATE 29.—FIRST PRIZE HOME-JERSEY BOAR, SYDNEY SHOW, 1924. A. N. WHITE'S "BLARNEY ROSE."

This boar was sold at the stud sales to W. H. Brown, the well-known South Australian stud breeder. This boar is a fine representative of the Dairy-Jerseys imported from Canada by Mr. F. G. Brown, of "Good Luck Farm," Toogoolawah, Queensland.

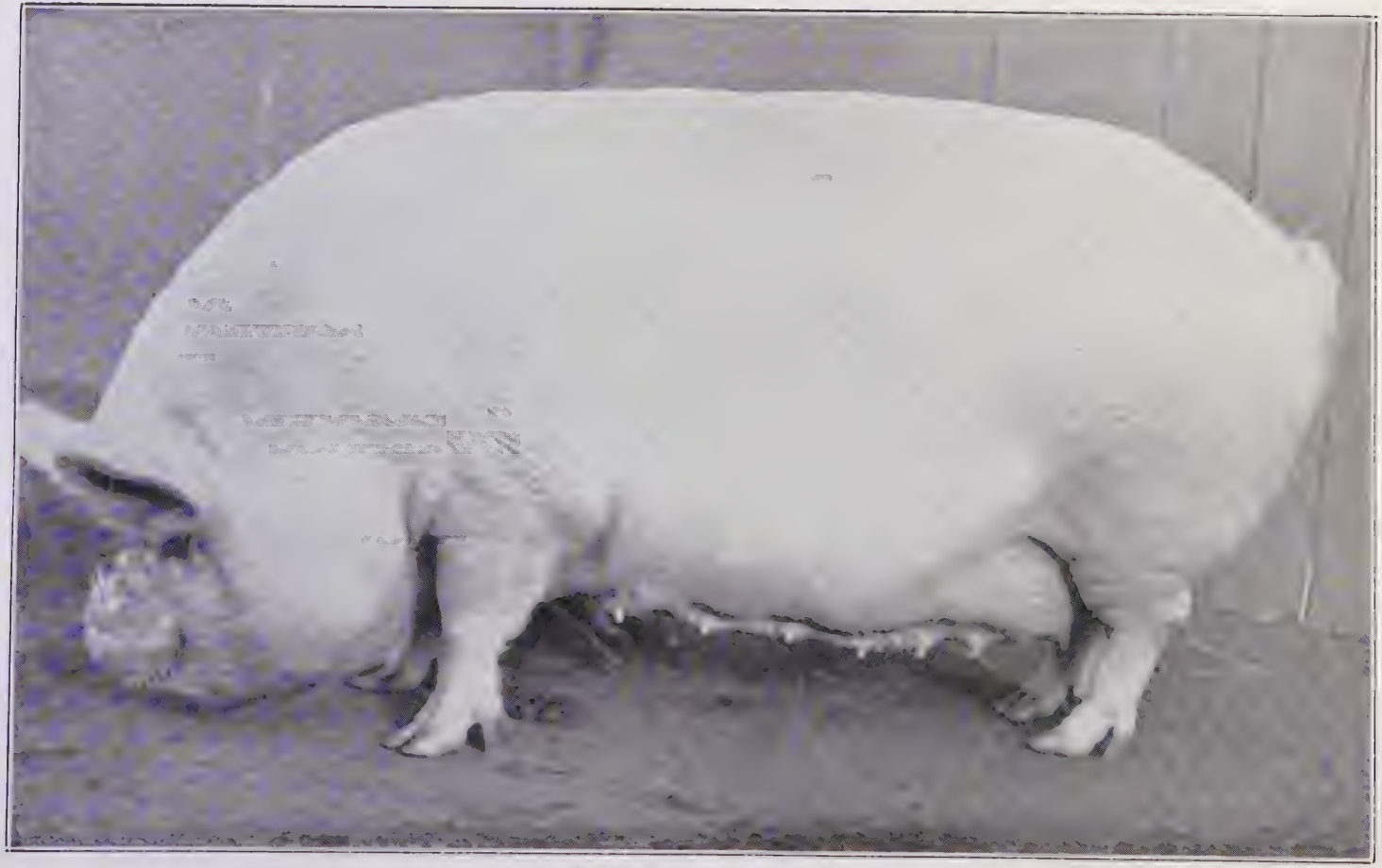

PLATE 30.—THE CHAMPION MIDDLE YORKSHIRE SOW, SYDNEY SHOW, 1924, RALPH JOYCE'S "LEONA" 2113.

She also secured the Championship at Melbourne Royal Show, 1923. She has been an exceptionally good breeder and mother, never having killed any of her suckers and never having less than eleven pigs in her litter. She represents the very best in the Middle Yorkshire breed.

PLATE 31.—FIRST PRIZE MIDDLE YORKSHIRE SOW WITH LITTER, SYDNEY SHOW, 1924. RALPH JOYCE'S "KYABRAM BEAUTY" 2465.

The litter is sired by "Coleraine" 2234, who won the Progeny Group Prize, Royal Show, Melbourne, 1922. This litter was line bred. The sow only had the seven pigs, but made an exceptionally good job rearing them. The small black spots on the backs of the suckers are sale (paint) marks only. An exceptionally well developed lot.

## DANISH AGRICULTURAL TRADE.

The exportation of bacon, butter, and eggs from Denmark during 1923 was the highest on record, shipments of bacon having amounted to 375 million pounds, of butter to 245 million pounds, and of eggs to 67 million dozen. This compares with the pre-war average of 298 million pounds of bacon, 221 million pounds of butter, and 38 million dozens of eggs; an increase of 26 per cent. in bacon, of 11 per cent. in butter, and of 76 per cent. in eggs.

The net return to the Danish farmer during 1923, however, was not as satisfactory as the above figures would indicate. While butter and eggs yielded a considerable profit, this was more or less offset by the low net returns realised from bacon, inasmuch as prices for both corn and barley have increased, while pork quotations have decreased.

Denmark must import practically all of her agricultural machinery requirements and other manufactured products, and her animal feedstuffs requirements. The high prices of these articles during recent years has resulted in a very unfavourable balance of trade for Denmark. Depreciated exchange rates and high prices in Denmark, together with the lower prices received for the agricultural commodities exported to the United Kingdom and Germany, combined to reduce materially the income of the Danish farmer for the year.

Danish success in foreign markets has been established upon a quality product. Prices received for Danish agricultural exports are usually on a slightly higher level than American goods can command in the same foreign market. Any attempt at increasing a market for American bacon, for example, in a market where Danish competition has to be met, must be based not so much on better prices as on a competition of quality and selling methods. Before and after the war, prices of Danish bacon on the British markets have always averaged from 2 to 10 cents per pound more than the American. The increasing exports of Danish butter to the United Kingdom, where it receives top prices, is another indication that a quality product can hold its own market.

The foregoing notes having been extracted from the information published in Weekly Crop and Market Report issued by the United States Department of Agriculture, should be of considerable interest to Queensland pig raisers and manufacturers, as indicating the necessity for strict attention to quality in considering the possibility of opening up export outlets for our bacon, hams, lard, and smallgoods. It also emphasies the fact that in competition with Denmark our manufacturers will have to stick to "quality goods" and "attractive get-up," combined with consistent effort in regulating supplies in order to secure a permanent footing on those overseas markets for Queensland hams, bacon, &c.—E. J. SHELTON, H.D.A., Instructor in Pig Raising.

PLATE 32.—A GROUP OF PRIZE-WINNING BERKSHIRES AT TOOWOOMBA SHOW, 1924.
Note the even quality and type.
They are the property of Mr. J. W. Handley, Bon Vale, Murphy's Creek, Q.

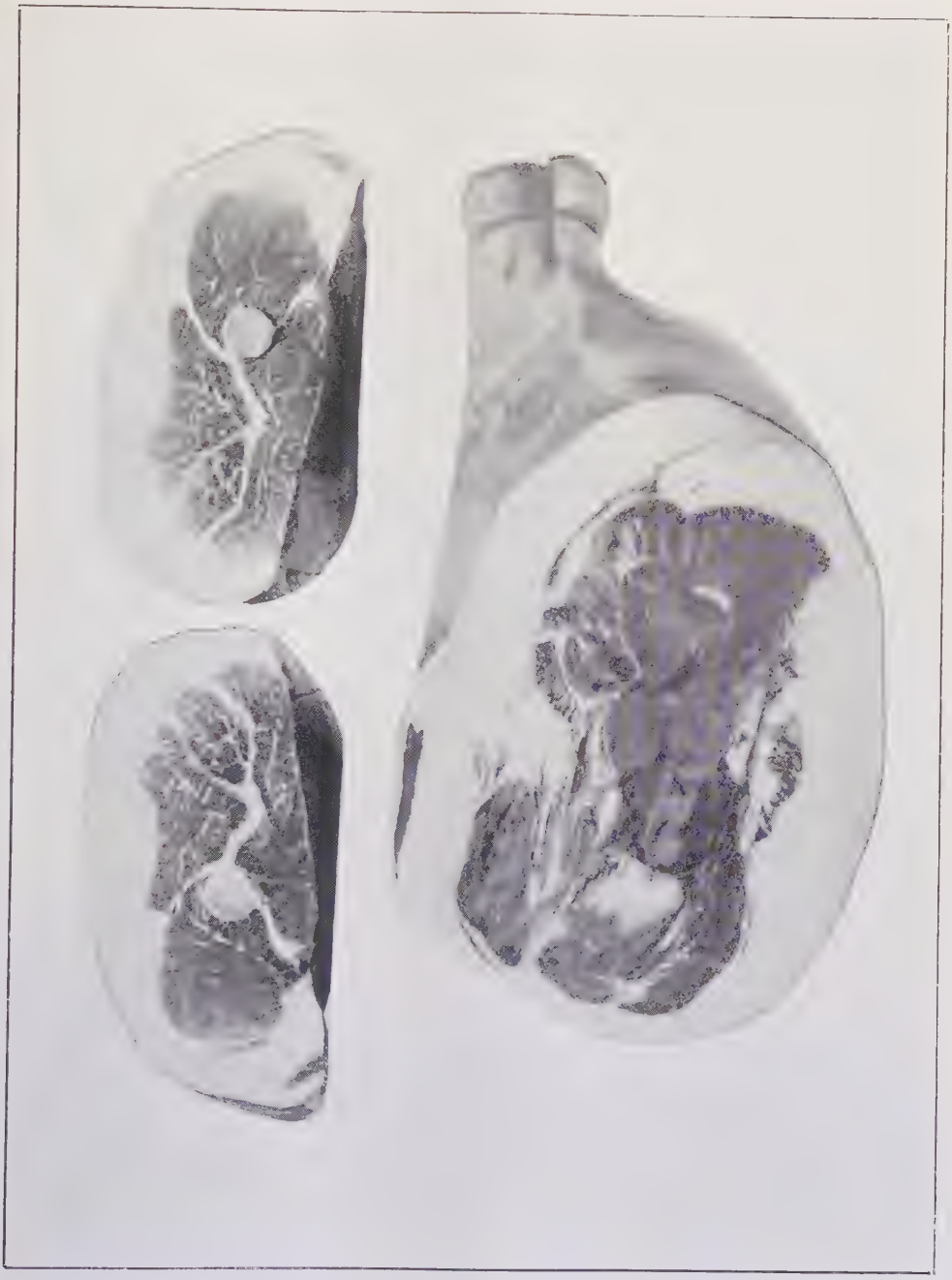

PLATE 33.—QUALITY HOLDS ITS OWN MARKET—A CHAMPION PRIZE-WINNING HAM.

Note the even distribution, the "marbling" of the fat and lean meat, the fine texture and quality of the flesh, its appetising appearance —the result of careful selection and up-to-date methods of butchering and curing—and the neat, attractive manner in which this ham was prepared. There is no reason why Queensland should not produce Hams as rich in quality and as attractive in appearance as this.

# MIXTURES FOR PIGS.

## CHARCOAL, WOOD ASHES, AND LIME.

E. J. SHELTON, H.D.A., Instructor in Pig Raising.

It is essential in a proper system of feeding pigs that provision be made for a supply of charcoal, lime, and other substances.

The following mixture has proved very suitable for this purpose, and as the ingredients are reasonable in price and not difficult to obtain it should not be difficult for any farmer to provide a supply for his pigs at all times. The recipe is as follows:—

Mix:—Charcoal, 20 lb.; hardwood ashes, 20 lb.; coarse salt, 8 lb.; air-slaked lime, 4 lb.; flour of sulphur, 4 lb.; powdered copperas (sulphate of iron), 2 lb.

Prepare as follows:—First mix the lime, salt, and sulphur thoroughly, then add the charcoal and ashes. Dissolve the copperas in two pints of hot water and sprinkle over the whole mass, mixing it thoroughly.

Keep some of this mixture before the pigs at all times in a strong box securely fastened in a weather-proof corner of the sty. Provide ample clean, cold water at all times.

Lime water should be added to the morning feed, using half a pint to each two gallons of food. It will also pay to add a few ounces of sterilised bone meal to the food of the growing pig. This meal can be ordered specially for this purpose from any of the leading dealers in artificial fertilisers. It may seem that these condiments are expensive and unnecessary, but in actual practice they will give a handsome return on the outlay, though it might be difficult to demonstrate this in actual pounds, shillings and pence.

These mixtures will satisfy the pig's desire for mineral substances, and will prove of added value as a tonic and appetiser. Salt licks also are becoming more popular each year.

Minerals are just as important in the growth and development of the pigs as are proteins, carbohydrates, fats, vitamines, ash, water, and other nutrients, and more attention should be given to their provision, because as a rule insufficient quantities are present in the ration.

All pig rations, of course, contain some minerals, but there are practically no pig rations, unless specially prepared, that contain an adequate quantity to meet the requirements of the pig's body. Pigs need minerals for the building up of bone, for making muscle, for cell division, and for the carrying of innumerable physiological functions.

Without minerals, growth and development will be restricted and the pigs will be less profitable. Many pigs suffer because they receive inadequate quantities of minerals, but no pigs suffer because too large quantities are given to them. Consequently, we should see that out growing pigs have access at all times to a good mineral ration balancer.

### Corn Cob Charcoal.

A good use for the corn cobs (cores) that have always been allowed to accumulate on most farms and around piggeries, is to make charcoal of them. The cores in themselves do not make a good feed for pigs because of their high and coarse fibre content, and even if the whole cob (corn and core as well) is ground, it has yet to be proved that there is an added value in them. The core is practically indigestible fibre that only burdens the pig's digestive organisation and causes indigestion.

After the pigs have taken all the corn from the cob, however, the waste cores can be raked together into a pile and burned to the point when it is all a live mass of coals. Water should then be sprinkled over the pile to put the fire out and the partially charred cores gathered up for the pigs. If there are any other "chips" available or any old corn husks these should also be gathered and burned and added to the charcoal made from the cores.

Some of the farmers in the Rivers district of New South Wales have for years followed this practice, and in these days when suction gas plants are in use to such an extent quite a large trade has sprung up for the charcoal burners. In this case large pits are dug in the ground and suitable lengths of logs are pulled into these; they are then fired and after a time are covered with earth. In a few days' time a good class of charcoal results. These farmers have been making good money and at the same time cleaning their holdings.

It should not be forgotten, of course, that all pigs should be allowed abundant range over good, green pasture to have the advantage of plenty of green food, cornstalks, sorghums, soft sugar-cane, root crops, grasses, &c., as well as their usual supply of milk.

Our illustrations are from the Warren State Farm, where the manager has wisely adopted the practice of saving as much wood ash and charcoal as possible, and feeding it to the Berkshire pigs which run on the farm.

Plate 34.—Gathering and Bagging Charcoal and Wood Ashes in the Course of Clearing Operations at Warren State Farm, Queensland.

Plate 35.—Clearing Operations at Warren State Farm, Q.

After bagging the charcoal the surplus wood ash is raked up and distributed over other areas. It also has a value as a constituent in mineral mixtures for pigs.

# THE PRICKLY-PEAR COMMISSION.

## PLANS AND PROCEDURE.

*The permanent judicial and administrative tribunal created recently and designated the Prickly-pear Land Commission is the outcome of recommendations submitted to Parliament by a Royal Commission appointed to inquire into every phase of Queensland's prickly-pear problem. The new authority, composed of three members (Messrs. W. L. Payne, F. D. Power, and William Purcell) is entrusted with full and sole control of all matters pertaining to pear infestation within the State. All pear-infested holdings of varying tenure are now under the jurisdiction of the Commission, and one of its first duties is to revise and harmonise the conditions governing the different tenures. Subjoined is an interesting account of some means it has adopted in combating the cactus curse.—Ed.*

The Prickly-pear Land Commission has now entered upon its work of checking the spread of pear, testing methods of eradication, and evolving means for reclaiming infested areas that are now lost to production.

### Simplified Judicial Procedure.

In order to facilitate its work the Commission has evolved new Rules of Court, and simplified legal procedure. The straightforward simplicity of the new procedure should recommend itself to all landholders. On electing to have their holdings considered by the Commission, landholders are supplied with printed question forms, the answers to which, written in by the landholder, together with official reports, will supply the Commission with all the information required to arrive at a decision in each case. The settler supplies these answers in the quiet of his own home, building up his case point by point without the disturbing atmosphere of the open court. There are no fees to pay, and agents or advocates are unnecessary. If, however, the settler prefers to appear before the Commission, either in open court or in chambers, in person or represented by an agent, he is perfectly free to do so. It is an advance step in simplified court procedure which should be welcomed, and only by its adoption can the Commission hope to dispose of a vast volume of work. It is provided that settlers desiring to have their holdings considered by the Commission must make application within six months after the commencement of the Act. The selector can do no possible harm by coming under the administration of the Commission, and he may reap some benefit by doing so. Although there is much to be done in a judicial way the Commission has made it quite plain that it has one settled objective: the destruction of prickly-pear. To this end, it is concentrating on administrative work in a thorough and practical manner, as it is recognised that with an enemy like the pear that spreads so rapidly any "wait-and-see" policy would be fatal.

### Methods of Pear Eradication.

At this juncture, it would be unwise to assume that the cochineal insect has solved or will solve the question of pear eradication. Up to the present its work has been satisfactory and promising. Biological activities have an important place in the pear campaign; they are likely to prove a valuable ally in dealing with the denser infestation, and, recognising this, the Commission has been in communication since May last with the Commonwealth authorities controlling these biological researches, urging definite action in this respect. The Commission recommends that these experiments should be continued and intensified until every means of eradication has been thoroughly tested. The Commission has also elaborated arrangements for the employment of the best known, cheapest, and most effective poisons to deal with pear in comparatively lightly-infested country.

### Best Poisons Available.

The most effective poison in use to date is arsenic pentoxide. It is recommended by the Commission for spraying young pear and injecting bunches of scattered growths. A tender has been accepted for the supply of 100 tons of this poison, which will be made available to settlers at 9d. per lb. Arsenic pentoxide before using is mixed with four times its weight of water—2½ lb. of poison to 1 gallon of water—so that the price of the actual working mixture works out at about 2d. per lb.

Another effective poison, already well known to landholders, is Roberts' Improved Pear Poison. The Commission has arranged with the proprietors to purchase the whole of their Queensland output for twelve months, and is making the poison available to landholders at 4d. per lb., with containers free of charge. Broadly speaking, the suitability of the two poisons may be summed up—Arsenic pentoxide for spraying young pear and injecting scattered bunches; Roberts' Improved Pear Poison for spraying old, tough pear and dense masses. With these two poisons available at reasonable prices, the settler is well equipped for the fight against the pear.

To secure these poisons, the settler must make application on the prescribed forms which are to be had from any local Land Office. On the back of these forms is printed a deal of poison information which the landholder will find useful. It is understood that the Commission urges landowners to make early application for these poisons so that they may gauge requirements for future supplies.

### Buffer Areas.

The system of buffer areas now engaging the attention of the Commission will, when completed, play an important part in keeping the prickly-pear within bounds. The work is of some magnitude and will take time.

### Assistance to Local Authorities.

As a further measure to ensure the effective co-operation of the Local Authorities, the Commission is granting those bodies a subsidy of £2 for every £1 spent by them in pear destruction, and arranging for co-ordinated effort for the purpose of eliminating overlapping and waste.

### Closer Settlement.

It is frequently urged by persons unacquainted with the lands of the State that closer settlement on the edges of the pear country will solve the pear problem. The fallacy of this, according to the Commission, can easily be demonstrated. For closer settlement there must be good land suitable for the purpose, but the edge of the pear country in the West often comprises second-class cattle country, requiring at least 20,000 acres as a "living" area. Even then, the proposition is not an attractive one. It is clear, therefore, that "closer settlement" offers no solution; as a matter of fact, experience points to the contrary. The settlement on land in areas too small to support the settler has repeatedly resulted in the neglect and abandonment of the country, and has been one of the many causes contributing to the spread of pear.

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## MILKING RETURNS, COLLEGE DAIRY HERD, JUNE, 1924.

| Name of Cow. | Breed. | Date of Calving. | Total Milk. | Test. | Commercial Butter. | Remarks. |
|---|---|---|---|---|---|---|
| | | | Lb. | % | Lb. | |
| College Mignon | Jersey | 24 Mar., 1924 | 570 | 5·7 | 38·40 | |
| College Prima Donna | Friesian | 9 April, 1924 | 810 | 3·8 | 36·00 | |
| Iron Plate | Jersey | 3 Mar., 1924 | 600 | 4·3 | 30·00 | |
| College Desire | Ayrshire | 28 May, 1924 | 540 | 4·4 | 29·76 | |
| College Meadow Sweet | Friesian | 17 Mar., 1924 | 660 | 3·5 | 27·00 | |
| Yarraview Village Belle | Guernsey | 3 April, 1924 | 480 | 4·8 | 27·00 | |
| Fair Lassie | Ayrshire | 29 Oct., 1923 | 480 | 4·4 | 24·60 | |
| College Sunrise | Jersey | 3 Jan., 1924 | 480 | 4·4 | 24·60 | |
| Lady Peggy | Ayrshire | 24 April, 1924 | 570 | 3·6 | 23·70 | |
| Netherton Belle | ,, | 30 Oct., 1923 | 450 | 4·4 | 23·10 | |
| Hedges Nattie | Friesian | 21 Nov., 1923 | 510 | 3·8 | 22·80 | |
| Miss Betty | Jersey | 30 Oct., 1923 | 390 | 4·9 | 22·50 | |
| Sweet Lassie | Ayrshire | 27 Mar., 1924 | 420 | 4·2 | 20·70 | |
| Myrtle Blossom | ,, | 9 Mar., 1924 | 510 | 3·4 | 20·10 | |

# Bureau of Sugar Experiment Stations.

## FIELD REPORTS.

*The Northern Field Assistant, Mr. E. H. Osborn, reports under date 24th July, 1924, as follows :—*

### Herbert River.

*Cane Varieties.*—Only the following varieties have been approved for local planting:—Badila, Goru, H.Q.409, H.1900, and Q.813. H.Q.409 has been planted out rather extensively this year. It is a cane of high density and is said to ratoon well. Mr. G. Geeson, of Ripple Creek, will be cutting a crop of fourth ratoons during the season and expects to get about 15 tons per acre. Probably this grower's success in ratooning lies in the way in which his ground is worked. He is a great believer in subsoiling. His farm has been under cane for many years. H.Q.409 is a slow striker, and evidently should be planted very early or else very late, and without too much covering. It also seems to do well in heavy soil.

Another cane that has become popular here lately is Q.813, mainly on account of its good striking properties and very quick growth. It can be planted either early or late, in poor or medium heavy soils, and besides carrying a high density also ratoons well. Mrs. E. P. Lyons, of Macknade, has just harvested a 35-ton crop of plant Q.813, and has also some very good first ratoons.

Among other varieties some magnificent E.K.1, Q.855, Q.813, and H.109 were noticed upon Mr. L. Roarte's Cordelia Farm. The two first-named canes are exceptionally good; in fact, the E.K.1 was one of the best samples of its variety that the writer has seen. All the cane on this farm looks well, as the ground is kept in a state of thorough cultivation by the owner, who limes, ploughs in all trash, green manures, and uses artificial fertilisers. His young plant cane, mainly Goru, looked a picture when last seen. This land has also been continually under cane for many years, but is probably growing better average tonnages now than it did years ago.

### Lower Burdekin.

This cane centre was visited early in July, when the outlook was very promising. In Ayr itself, a large number of new and substantial buildings were being erected, and by the large number of visitors met with it is easy to see that the present through train service with Brisbane has helped materially to advertise the natural resources of the Lower Burdekin. The three local mills were operating very smoothly, and all anticipated a very fair season.

The rainfall for the year aggregated to date 28.93 inches, or easily more than twice last season's total fall, and the crops in general looked very fair.

Very large areas of healthy-looking young plant cane were to be seen. The strike had been a remarkably good one throughout the cane areas. Two of the largest acreages of young plant are those of Hoey Brothers and Mr. W. Payward. The first named have already planted 110 acres and are now preparing 50 acres more. Mr. Payward has some 80 odd acres well through.

Both these farms look extremely well. Tractors are, of course, responsible for the above large plantings, Messrs. Hoey Bros. ploughing day and night to get their cane planted. Another use for tractors in this area is for pumping power. Many farmers of limited means have greatly benefited by their use since they became so very popular on the Lower Burdekin.

Cultivation work in general reaches a very fair standard of efficiency in this district, the growers in general being very keen upon trying out any new implement that will give results.

Here, however, as in many other of the sugar areas, the lack of green manure is noticeable. Of course it means irrigating for manuring crops, but the growers who have done so claim that they get the results. Two, for instance, are Messrs. Payward and H. Todd.

Where green manuring has been carried out the texture of the soil is certainly improved, and young plant cane growing thereon looks uncommonly well.

It cannot be mentioned too often that, apart from the nitrogen accumulated from the air by a normally-grown bean or pea crop, the great value of the humus from these crops, and also trash when ploughed under (more particularly in such a dry district as the one now under review), cannot be over estimated; especially when we remember the well-known capacity of organic matter to conserve moisture in dry times.

*Fertilisers.*—The use of fertilisers is becoming more popular in the area, and a fair quantity is now used annually; but although results have been satisfactory, the full benefit to be derived will never be complete until preliminary cultivation is more thorough. Without that, neither the soil nor the particular brand of manure is given a fair chance to do its best.

## CANE CROP ESTIMATE.

The excellent season following on a dry period, combined with the fact that the acreage under cane has been rapidly increasing, will account for what will probably be the record yield of sugar in Queensland this season.

The Director of Sugar Experiment Stations states that, from figures he obtained during his recent Northern trip, it is now possible to give an approximate estimate of what the crop may be. Roughly speaking, it now appears probable that a yield of 330,000 tons of raw sugar may be looked for in Queensland. This figure is not so high as anticipated earlier in the year, but the continued showery weather in the North is expected to increase the tons of cane required to make a ton of sugar. Then, a great deal of arrowing has taken place, and a good deal of cane about Innisfail and Babinda was cut late last year and early in this, and is backward.

The above, with a yield of 20,000 tons for New South Wales and 2,500 tons in Victoria, will give a total output of 352,500 tons for Australia, a good deal more than is required for the consumption of Australia, so that the export of sugar will have to be undertaken.

There has been a great increase in sugar production north of Townsville during recent years.

The previous record was in 1917 when 317,000 tons of raw sugar were produced. A portion of this, some 10,000 tons, was lost in the 1918 cyclones.

## CANE PESTS AND DISEASES.

*Mr. W. Cottrell Dormer, Entomologist, reports under date 28th July, 1924, as follows to the Director (Mr. H. T. Easterby):—*

### BABINDA DISTRICT.

**Diseases.**

Four important diseases were observed in the district—these are Leaf Scald, Leaf Stripe, Top Rot, and Root disease. Leaf scald is to be found scattered throughout the district. For the most part it is doing but little damage, but nevertheless is a source of great potential danger to the growers, as has been pointed out by different authorities during the past eighteen months. Growers could do a great deal towards exterminating it if they would destroy all stools showing the characteristic symptoms while they are young and can be easily detected. Badly affected stools can be readily recognised by the light green and white striped colouring of the outer leaves and the almost pure white colour of the innermost ones. All the leaves are stunted and curled at the tips, and often look as though they had been scalded. Even if only these badly-diseased stools were destroyed it would be a step in the right direction. The disease was found to be particularly bad on one or two farms in the locality known as East Russell. On these farms diseased stools reached to as high as 10 per cent. to 12 per cent. In each case, however, it was noticed that the cane had previously received some severe check, such as drought or flood, so that the already weakened state of the plants probably went a long way in making the disease more virulent. Leaf Stripe disease was observed in its early stages in a small block of B.208 on one farm at Frenchman's Creek. On another farm in the same locality Top Rot disease has done rather severe damage in some Badila cane. Throughout the whole district Badila was found to be affected to a greater or less

extent by what is probably a root disease. Affected stems are "trash bound"—*i.e.*, the trash clings to the stick, bear adventitious aerial roots, are faded in colour and taper off unnaturally at the top. Usually only a few sticks are thus affected in a stool, but sometimes the whole stool is stunted. Examinations were made of a number of affected stalks, and it was found that quite a big proportion were primary shoots. In many respects this malady resembles Top Rot, but it is distinguishable from the latter since the leaves do not usually turn yellow and die; they remain stunted but green, though dead tops are occasionally to be seen. In some farms the weight and density of the crop have been seriously diminished by this disease. It has been observed that trashing affected cane three or four months previous to cutting has helped it on a great deal. Some growers expressed concern at the quantity of spots and markings to be seen on some of their canes. These were mostly due to Leaf Spot fungi (*Cercospora* spp.), and are of no great importance. Some canes when infected do indeed look to be seriously diseased, and the outer leaves die off somewhat sooner than in healthy stools. The effect on the plant is unappreciable; some varieties are far more susceptible than others. E.K.28 is very susceptible. These leaf spot diseases appear to thrive best during the winter months.

**Insect Pests.**

The district as a whole seems to be very free from insect pests this year. Some of the more serious pests were observed and several of the minor ones, but in no instance were they found to have attained serious epidemic proportions. Grubs of the grey-back beetle have done slight damage in scattered localities, but especially about Merriwinni and Mooliba. Most of these grubs have "gone down" to pupate previous to emerging as beetles. On one farm at Merriwinni a patch of about 3 square chains of heavy ratoon Badila has been seriously damaged and most of the stools have fallen over. However, sufficient roots remain in the soil to preserve the cane from deterioration for some time to come. In most cases where grubs were found the soil appears to be quite open enough for fumigation under auspicious weather conditions. One grower has already tried carbon bisulphide as a fumigant, and from the point of view of mortality has obtained good results. This was done last year; this year the infestation was not sufficiently great to warrant further treatment. To obtain efficient results the growers should bear in mind that it is necessary to destroy the grubs before they do any serious damage. It is because many growers wait until their cane is badly affected before they fumigate that results are frequently disappointing. Another mistake often made is to use carbon bisulphide when the soil is very wet, in which case the fumes naturally do not travel sufficiently far to cause a high mortality amongst the grubs. Grubs of *Lepidiota frenchi* appear also to have done slight damage, though the larvæ were not found. This was on a farm at East Russell, where some young plant Badila withered up in the leaves, and received a severe check in small patches during September and October of last year. The cane afterwards recovered, but is still a good deal backward. This would correspond with the rising to the surface soil of the grubs of the *frenchi* beetle at the commencement of the second year of their life-cycle, after having spent their first winter in a state of hibernation.

The cane beetle borer (*Rhabdocnemis obscurus*) has received a very severe check during the last couple of years. Its Tachinid Fly parasite is to be found established in every part of the district where Badila is the standard cane. It may be of interest to mention that early last year I visited a farm which was rather badly bored. Nine badly-bored canes were cut at random and carefully cut up. Each contained several borer grubs and some borer cocoons. Every one of those grubs contained maggots of the Tachinid Fly which were slowly destroying their hosts, and every cocoon contained the small brown egg-shaped pupæ of the flies. This means that not one of those borers would ever have reached maturity, which shows clearly how effective the fly can be when well established. Of course such results are not common, or else the fly would soon exterminate itself as well as its host. Dry weather and burning of trash have also undoubtedly been factors in the remarkable destruction of the borer during the last couple of years. The sugar-cane Aphis (*Aphis sacchari*) has been noticed during the last spring and autumn months by many growers throughout the district. The striking feature of this Aphis is that it is usually accompanied by a black fungus growth, which develops on the sugary secretions deposited on the leaf by the insect as it sucks the sap. A good description of the Aphis, and of the fungus, is given in the Entomologist's report for June, which Babinda growers should study carefully. Of other minor pests noticed I will only mention the Army Worm and the Wire Worm. The former (*Cirphis unipuncta*) was reported to me as having done slight damage on one farm in the Palma locality, while the Wire Worm (*Monocrepidius* sp.) is reputed with having been occasionally destructive in some low-lying country at Mooliba.

*The Director of the Bureau of Sugar Experiment Stations (Mr. H. T. Easterby) has received from Mr. E. H. Osborn, Northern Field Assistant, the following report, dated 10th July, 1924.*

**Proserpine.**

When it is remembered that the total rainfall for this area for 1923 amounted to only 27·49 inches, against an average of 75 inches, and that 5 points represented the October, November, and December falls, it is surprising how marvellously the crops have recovered under such unfavourable conditions. Present indications point to a very fair crop for this season.

At Banana Pocket, particularly, seasonal prospects are bright. Much solid work has been put in here lately, and the improvement since my last visit here eight months ago is very noticeable. In such a new area the crops ought to look well, and some very heavy tonnages of H.Q.426, N.G.15, Q.1121, M.1900, Q.813, and D.1135 were seen. Some of the Q.813 (February planted) looked extremely well. The stools were good and the length and thickness of cane very fine. This cane appears to be very popular in the Proserpine area. Some very solid D. 1135 was also seen in the neighbourhood, as well as some really splendid Badila, both plant and first and second ratoons.

Two tractors are in use in the Pocket, the owner of one (Mr. J. Smith) speaking in glowing terms of its usefulness. It is also very probable that a locomotive will be used this year to haul the cane from the Pocket to the siding upon the North Coast Railway at Thompson's Creek, thereby reducing the transit charges to the grower very considerably. Taking the Proserpine area as a whole its conditions are very promising. Better and more thorough cultivation is evident and larger areas are going under crop. About twenty-six tractors are now in use against the four or five that were there, say, a couple of years ago, and several more are on order. The new area at Bloomsbury was not visited, but it is reported that the cane there looks very well.

*Diseases.*—So far this area has been very free from disease. A couple of stools of Badila and one of Striped Singapore were noticed to be affected with leaf scald, while on another farm, mosaic was noticed in an odd stool or two of Singapore. It cannot be emphasised too strongly the absolute necessity of growers using none but the very best seed for planting, casting aside any that does not seem thoroughly sound and healthy looking. The following figures of last year's crop are interesting:—

| Variety of Cane. | Per cent. of Crop. | Average c.c.s. |
|---|---|---|
| Badila | 8·3 | 14·4 |
| H.Q.426 | 28·3 | 14·0 |
| Striped Singapore | 3·6 | 13·9 |
| Q.813 | 17·9 | 13·8 |
| Other varieties | 10·1 | 13·7 |
| Malagache | 8·8 | 13·0 |
| D.1135 | 4·4 | 12·9 |
| M.1900 | 9·1 | 12·8 |

Of the canes classified as other varieties, the following extra particulars are given:—

| Variety. | No. of Samples. | C.C.S. |
|---|---|---|
| Violet | 17 | 15·0 |
| B.147 | 10 | 14·8 |
| Q.1121 | 21 | 14·2 |
| Q.116 | 46 | 13·9 |
| B.208 | 15 | 12·7 |

*Weeds.*—It will be remembered that in some recent sugar notes upon the Mackay and Burdekin districts, Mr. Cottrell Dormer, of this Department, spoke of a certain cane-stunting weed noticed. Mr. Thoroughgood, of Kelsey Creek, having reported that odd stools of D.1135 plant were dying out from no apparent cause, a sample of the weed was sent to Brisbane for identification, and the reply was that the weed seemed identical with the Mackay one, and that it was advisable to get rid of it as soon as possible. Luckily the weed is a delicate one and should be easily eradicated when first noticed.

*Grubs.*—Grubs were noticed in several places, particularly at Kelsey Creek. There they had severely damaged a fine crop of Q.813, and in another place some Badila ratoons. In this particular area a block of D.1135 was eaten out last year, and was replanted during December with Q.813. So far this block looks well, and it seems that the late planting will prove a success, although as a rule Q.813 does not stand up to grubs too well, its rooting system seeming fairly shallow.

### Bowen Areas.

Unfortunately, the very dry conditions of last year militated against planting in this area, and in consequence the crop to be harvested this season will be small. A much larger acreage will be cropped next year. Several good crops were noticed, mainly those of Messrs. Hildebrand, Stacklerotti, Darwin, and R. Miller, the latter having some real good-looking first and second ratoons, mostly N.G.24 B (green Goru). Some seven months old plant N.G.15, B.208, M.1900, 24B and Malagache also showed splendid growth. This crop looking so much above the general average is accounted for by the fact that plenty of water had been used, and also the soil is very good.

### Rollingstone to Mutarnee.

At Rollingstone Mr. S. McCree hopes to harvest some 50 odd acres of plant cane, amongst which is some really first-class Badila. He hopes to have another 30 acres next year. This grower is also laying down a tramline from the farm to the siding across the creek. Further up the line, at Mutarnee, a very heavy crop of Badila of splendid growth and colour was noticed upon Mr. C. Barney's farm. Some 150 tons of this cane has been sold for plants to Giru and Gumlu, and should be a good change.

At Mr. V. Tealby's place some remarkably good first ratoon Clark's Seedling cut last October was noticed. One stool growing under "paddock conditions," intended for the Townsville Show, carried thirty-five sticks of probably between 7 and 8 feet of cane.

### Bambaroo to Yuruga.

Settlement has developed rapidly hereabouts during the past twelve months, and the number of settlers is steadily increasing. Taking all the growers between Rollingstone and, say, Toobauna, it is probable that they number about 100, and will send in, say, 10,000 tons of cane to Invicta this year, with the prospects of a very much larger tonnage for 1925.

Several very nice plots of cane were noticed near Bambaroo, mostly in a very well kept condition, and showing good cultivation. The largest block thereabouts would be a 20-acre paddock of young plant cane owned by Salvetta and Co.

At Yuruga, Mr. J. Holland intends harvesting some 14 acres of plant cane for this year, while some 28 odd acres have just been planted mainly with Badila, which looks well. Mr. Holland has purchased about 1¼ miles of portable tramline, and intends bridging Station Creek to connect with his farm.

The following rainfall figures are interesting:—

| | Rollingstone. | Bambaroo. | Ingham. |
|---|---|---|---|
| | Inches. | Inches. | Inches. |
| January .. .. | 7·99 | 10·18 | 7·39 |
| February .. .. | 9·35 | 9·02 | 11·73 |
| March .. .. .. | 21·31 | 13·97 | 15·11 |
| April .. .. .. | 6·89 | 2·39 | 9·77 |
| May .. .. .. | .. | .. | ·79 |
| Total .. | 45·84 | 35·56 | 44·79 |

### Herbert River Area.

When this district was visited during the first week in June, harvesting operations were in full swing, and everything pointed to a record crushing season. A very large area is already under cane, but judging by the large quantity of young cane to be seen this will be exceeded by 1925, and it is evident that the local mills will not be short of cane for some years to come. It will be noted by the rainfall figures that up to the time of writing the fall had been light, but conditions have changed, and later beneficial showers have helped the young growth along considerably.

In the cane area, in general, cultivation methods have improved, but there is yet room for improvement, particularly in respect to liming and green manuring. As lime may be obtained so reasonably in the Herbert it is surprising that more is not used. The use of fertilisers has increased considerably, but results would be much enhanced were liming and green manuring more popular.

*The Southern Field Assistant, Mr. J. C. Murray, reports as under (10th July, 1924):—*

**Brooloo.**

The township is the terminus of the Mary Valley line. Practically from the time the train leaves Gympie, fertile agricultural land is traversed. Belts of heavy scrub, accessible to cultivation when cleared, are still standing, and at intervals prosperous looking banana plantations afford evidence of a flourishing industry. Cane farms occur at intervals up the valley, but, as yet, there is no group of farmers growing cane solely, as, say, at Bundaberg.

This year's crop is making a good showing. Mr. Bath, the teacher at the local State school, takes an active interest in canegrowing and has a block that will harvest well. The Q.813 is the best. Other varieties making good growth are H.Q.285, D.1135, and M.1900 Seedling.

The farmers, owing to the proximity of dense scrubs, have some trouble with the wallaby pest. The following method of extirpation is worth trying:—

Take a pint of pollard and mix into a stiff mass with molasses, add a little oil of aniseed and poison with arsenic. Make a drill down the cane rows and drop in the mixture at intervals in quantities about the size of marbles.

The soil around Brooloo is volcanic on the hills and alluvial on the flats. Most of the soil cultivates and drains well and has a slightly acid reaction.

In view of the number of live stock raised in this district, the farmers should find it profitable to grow forage cane. Owing to the distance from the mill, growers are advised not to plant cane too extensively, but to produce on limited well-cultivated areas.

**Cooroy.**

Although the farmers here contemplate growing cane more extensively, at present there is only a small acreage. A meeting of farmers interested was held a few weeks ago to discuss mainly the possibility of having a derrick erected for loading at Cooroy Station. No loading facilities and bad roads are effective drawbacks to cane production. The Cooroy district is suitable for sugar-cane growing, as the soil is good and the rainfall abundant. It is not advisable, however, for farmers to start planting on land where they cannot ultimately use the plough.

Two varieties of cane doing well in the Cooroy district are H.Q.285 and D.1135. Farmers will probably find these canes the most profitable. The first named is susceptible to frost and should be planted on the higher land.

**Yandina-Maroochy District.**

The cane looks very vigorous and healthy in these areas, and new farmers are coming in from other parts of the State and from New South Wales.

The varieties most generally grown are H.Q.285, Q.813, D.1135, and N.G.16. There is, however, a large number of other canes growing, most of which have been discussed in previous reports.

Disease was showing at intervals, principally the infection known as "striped leaf disease." In combating this the growers are urged to be careful in plant selection, and before cutting sets, to go through the field and tie a band of trash on any suspicious looking stool, for the guidance of the men cutting.

Care should be taken to avoid, if possible, canes that are not good harvesting and milling varieties. Uba is a bad harvesting cane owing to its thin sticks and very often adhesive trash. If a variety is a bad milling cane, the efficiency of the factory is lowered and the whole of the suppliers suffer.

Gumming disease was not met with in these areas, but, in view of the fact that there are plants being introduced from the Northern Rivers of New South Wales where this disease is prevalent, the following brief description may be of use:—Apart from the gum exuding on a cut surface this ailment can be recognised in affected cane by the appearance of the top. This will be rotten or dead and the shoots will be dry and snuff-coloured.

The farmers in these areas are recommended to try the use of green manures on the higher lands, and lime on the heavier river flats, to improve the texture.

**Mullett Creek.**

A few farmers here have cane growing, and the present crop looks promising. For the greater part scrub land is being utilised, but there is a considerable acreage of good quality forest land within a 10-mile radius of Mullet Creek Railway Station.

The roads here are fair, and the haulage distance is not great; therefore, the farmers should do fairly well with the areas they have planted.

Cane varieties successfully grown are H.Q.27, E.K.1, E.K.2, E.K.28, Q.813, H.Q.285, N.G.16, and M.1900 Seedling. No disease was apparent. Cotton grows well on the lighter soil at Mullet Creek. Farmers would no doubt find a field of this fibre profitable as well as the cane.

**Avondale.**

A big crop should be harvested at Avondale this season. The plantation and farms have been cultivated excellently, and the growers are reaping the benefit accordingly. The varieties showing the best growth are Q.813 and H.Q.285.

Very little chemical fertilising has been carried out at Avondale, the land appearing to respond naturally after rain. It is probable that Fairymead could produce heavier ratoons by the use of molasses on these sandy soils. Molasses improves the texture of light soils, as indicated by successful experiments tried elsewhere.

There appears to be a tendency in the various districts visited to plant cane in preference to any other crop.

*The Southern Field Assistant (Mr. J. C. Murray) reports to the Director of Sugar Experiment Stations (Mr. H. T. Easterby) under date 21st July, 1924.*

**Bingera.**

In the Bingera area, of which Messrs. Gibson and Howes' mill and plantation are the centre, there is every prospect of a good yield. Crushing will probably continue until Christmas. Most of the varieties going to the mill are excellent from a factory point of view, although there will be a small percentage of Uba. Density will, no doubt, be low at the start of operations, as the heavy sweet canes are not fully matured before the end of September.

There is very little disease in the Bingera areas, although an indigenous fungoid parasite is attacking the roots of the 1900 Seedling in places where the cane is backward owing to poor soil conditions. There is certainly no cause for the alarmist reports that arise from time to time regarding widespread infections in these districts contiguous to Bundaberg. Mottling of the leaf is common, but disappears as more favourable growing conditions prevail.

Farmers might plant more H.Q.285 and E.K.28 than they are doing at present. The latter is worth more extensive planting.

Soil conditions in the Bingera areas are favourable for the production of a good crop of cane The average reaction of the soil is slightly acid, but experiments prove that lime is not required, excepting in cases where the drainage is poor and the soil lumpy. Lime would then be of use to improve the texture of the soil.

Grub is causing small losses. One grower reports having ploughed in a crop of weed commonly known as "Stinking Roger," which had the effect of considerably checking the infestation. Evidently there may be a constituent in this weed that is either a poison or a repellant.

**Gin Gin.**

Crops are in good condition and should harvest an average of 20 tons to the acre. Frost has not seriously affected the cane, in fact, the winter has been extraordinarily mild. Cane varieties that are looking well and showing plenty of growth are M.1900 Seedling, Q.813, and D.1135. Black Innis is a good cropper on some Gin Gin farms.

Canegrowers are gradually extending their areas. Land that has been idle for years, excepting for grazing purposes is being ploughed up and planted. Some of the old varieties, Striped Singapore, and Rappoe have been introduced and are making good growth. In dealing with these canes farmers require to be careful in plant selection on account of their susceptibility to "gumming."

**Mackay.**

The countryside generally looks most prosperous, the roads are being improved, comfortable dwellings erected, and people are lessening distances by the use of cars. On the areas in the vicinity of Mackay township the cane is not so heavy as on some of the river soils, although the c.c.s. content will be probably higher. The cane is arrowing very freely in this area, although, as yet, the stick is smooth with no shooting

at the eyes. Serious disease is not in evidence, although in a small patch of E.K.1 symptoms of disease, probably Mosaic, were showing. The node of the cane was shrunken and wax was peeling off. The internode was badly cankered and flesh of cane badly destroyed. Cankers were heavily attacked by fungus, and eyes of cane almost non-existant. The rind was mottled. Growers are advised not to plant this variety, as it is, apparently, in the Mackay district, susceptible to this disease.

A parasitic weed is growing on the roots of the cane in places. The damage done is unimportant. Other noxious weeds and grasses are well under control. The cane grub is not occasioning the growers serious trouble in these areas. In the Mount Jukes region, one of the most picturesque spots in the district, the cane is making a fine showing. Dense jungle originally covered this land. The formation here is peculiar, there being a shallow layer of topsoil and a subsoil which appears at first to be clay, but on exposure to the air crumbles and works up into excellent condition.

Grubs are causing the farmers considerable loss here. This is very often the case where farms are surrounded by feeding trees. Practically the whole of the well-known varieties do well here, but the only one so far that shows resistance to grub attack is D.1135. However, growers who are not troubled with the pest should try Q.813, N.G.16, H.Q.283, and E.K.28.

The cane is very free from disease in this area. A sooty fungus is prevalent on the leaves of some stools of Uba. It is harmless in itself, but no doubt does indirect damage to the cane by preventing the leaf from functioning properly.

The farmers in this locality are hampered by very bad roads. The tramline from the Marian mill, however, goes through the settlement. All classes of citrus fruits do well, particularly the orange. The hill slopes carry some beautiful pine, while cedar, lignum vitæ, and many other valuable woods exist. The main trunk line is about 6 miles distant.

Samples of typical soils were taken from this locality so that, on receiving the the results of the analyses, the farmers will have a guide if they wish to do any fertilisation.

In planting it is probable that the best way would be, instead of cane-holing in the usual way with a mattock, to drive a bar down, loosen a little and plant the cane about 10 inches deep. If the cane is not planted deeply in this soil it falls down as soon as it makes weight. Canes grow very rapidly in this locality; too rapidly for the roots to hold them at times.

On returning to Hampden from Mount Jukes no conveyance was available to take us on to Marian so we walked across country, a distance of about 8 miles. There is a considerable area of cane growing on the country traversed. There is abundant water and the cane looks well. The soil is a dark loam, in many instances being typical of that prevailing at Maroondan. Lime and green manures would be beneficial on land of this description. Canes that should give the best results here are H.Q.285, Q.813, and 1900 Seedling. A number of farms were inspected on the north and south banks of the Pioneer, above Marian. Many of the growers were busy ploughing, planting, and fertilising. Here, again, green manures and lime would be beneficial. Both Mr. McHardie and Mr. Paul, of Marian, have demonstrated that the use of earth lime, of which there is a local source, gives excellent results. With lime of this description, anything from 2 to 10 tons per acre could be applied according to the nature of the soil. Previous tests taken from these soils show a slightly acid reaction. It would pay the growers in this locality to co-operate in getting supplies of this material. No doubt the mill authorities would assist them.

**Farming Efficiency.**

In relation to the sugar industry, farmers are prone to stress the point of raising the efficiency of the mill to the neglect of the primary point of raising the efficiency of farming. It would be difficult to get a 10 per cent. increase in the efficiency of a mill, but not impossible to get an increase of 10 per cent. in the efficiency of farming. This could be accomplished by careful plant selection, judicious fertilising, green manuring, and periodic use of lime. Changing of plants is also a good feature. The introduction of a number of drayloads of soil from a fertile block on to a poor one is often a useful measure.

A visit was made to a locality known as the Hollow, about 6 miles south of Mirani. There are a number of settlers here from Great Britain. The soil for the greater part is low grade, but accessible to the plough, and if properly worked would grow cotton, maize, fodder canes, and grasses, while some on the flats would produce sugar-cane. However, it is probable that only a most experienced farmer could make this land pay. It is stated that these settlers were badly advised in London. They are a good type of people, educated, some married, with families, and had a fair money reserve. People in England would be well advised, before coming to Queensland, to obtain reliable information from the Queensland Department of Agriculture.

## SUGAR CROP PROSPECTS.

The Director of Sugar Experiment Stations (Mr. H. T. Easterby) has returned to Brisbane from a visit to the sugar districts of Bundaberg, Mackay, South Johnstone, Innisfail, Babinda, Cairns, Mossman, and Lower Burdekin. Speaking generally, Mr. Easterby said that excellent crops were in evidence in all districts visited except parts of Bundaberg. The promise in this district early in the year was good, but until quite recently little or no rain had fallen since March, and the crops, particularly on the Woongarra areas, had retrograded, and some of the mills had reduced their estimates. The recent rain would, however, have a beneficial effect on the whole district, although perhaps too late to much aid this season's harvest.

### Mackay.

At Mackay conditions were good, and it is apparent that a much better crop will be harvested than has been the case for some years. The present estimate of the mills in this district is approximately 54,000 tons of sugar as the season's output.

### Johnstone River.

The crop in the Johnstone areas, while very large and probably a record owing to favourable weather and the planting up of new areas, will not in the Director's opinion reach the very high figures of early anticipations. For instance, at South Johnstone estimates were framed reaching the probable enormous yield of 293,000 tons of cane for the South Johnstone Mill. The present estimate of the mill authorities is 200,000 tons of cane which may be harvested under favourable conditions. This mill is doing splendid work this season, the labour difficulties of last year having been overcome, and an extra shift is now worked on Sundays. Crushing per day often exceeds 1,000 tons of cane. Due to continued rains in this district the present commercial sugar in the cane is on the low side, which may also affect the estimate. Further, a great deal of the cane has arrowed this year so that no further growth is expected. In addition to this also some crops are cutting out lighter than was anticipated. The cane looks healthy and vigorous, however, and scarcely any disease was visible at present. The whole of this immense area is fine sugar-producing country, and droughts are unknown. The rainfall to date has been some 110 inches. Some of the cane supplied to the South Johnstone Mill is sent in with too much trash roots and tops. Trucks sampled before and after cleaning the cane showed great differences, and the improvement in monetary value after cleaning varied from 8s. 3d. to 13s. 4d. per ton. The foregoing may indicate why to some extent South Johnstone has failed to secure as high a sugar content as other mills in this district. Grubs were doing a little damage also the borer weevil. The liberation of the parasitic Tachinid fly by the Entomological Division of the Bureau of Sugar Experiment Stations is keeping the borer in check.

### Goondi.

The Goondi Mill was found to be doing fine work, also Mourilyan which started later than the other mills in this district. The Tully River lands are being planted with cane and the new mill is now well under way. Should all go well it is possible that a small crushing may be made towards the end of 1925. This land is the subject of inquiry from all over Australia.

### Babinda.

At Babinda conditions were very wet also. Up to date some 142 inches have fallen since the beginning of the year. The commercial cane sugar in the cane is at present on the low side. At the time of the Director's visit it was only 10 per cent. This year the mill expects to deal with 200,000 tons of cane if all conditions remain favourable, the total crushed last year being 165,000 tons of cane. It is remarkable how tonnages have increased in the North. Not so long ago 70,000 to 80,000 tons of cane were considered a fine crushing. Now such a crop would be considered very small by the Innisfail and Cairns Mills. Grubs were doing very little damage this year, and the cane looked very well. The Babinda Mill which was recently transferred by the Government to the farmers, was working well and smoothly. Improvements in the extraction and recovery have been made by certain alterations in the machinery.

### Mulgrave.

Considerable improvements have been effected at the Mulgrave Mill which was found to be doing very fine work. A new 14-ton vacuum pan has been installed as well as a suction gas plant of 47 h.p. for use in the off season. A further 22 miles of portable tram track have been purchased, and $3\frac{1}{2}$ miles of 40-lb. rails have been

Plate 36.—Field Day at Mackay Sugar Experiment Station, 6th June, 1924.
The Director (Mr. H. T. Easterby) Addressing Farmers.

Plate 37.—Field Day at Mackay Sugar Experiment Station, 6th June, 1924.

added to the permanent way. Two new Hudswell-Clarke locos. have arrived for the mill, together with an additional 150 cane trucks. The old fitting shop has been considerably extended and an additional electric pump (making four in all) has been installed providing for 250,000 gallons of water per hour. A large concrete reservoir with roof is being provided to store 275,000 gallons of molasses. Part of the molasses output is sold to the Federal Government for their factory at Brisbane.

The Mulgrave Mill has also found it necessary to reduce their original estimate for this year. The large area of arrowed cane and the fact that 2,000 acres of cane were cut very late last season are given as the reason for this. Very little damage has been experienced here from grubs this year. At Hambledon also, where grubs have been prevalent in recent years, little or no damage was being done this year. This mill has also made many improvements latterly, and has a very large crop to deal with this season.

### Mossman.

The Mossman district was also looking particularly well this year. The cane crops are good, little or no disease or grub damage was apparent. The mill which expects to crush 75,000 tons of cane this season, will commence operations in about a week's time. A new Babcock boiler has been put in and a further chimney stack is now being erected. A weir pump has also been added. The directors have decided to purchase a new crushing mill for next year, the rollers to be 72 by 34 inches. This mill will be placed in front of the other two existing mills. The cultivation in this district has considerably improved during the last few years, and perhaps more fertiliser is used in this district than in any other. There are at present 4,800 acres under cane. Preliminary trials showed an average of 11.6 per cent. of commercial cane sugar in the cane. Some excellent cane varieties were inspected at Messrs. Crees Brothers' farm, including H.Q.458 and E.K.28. A fine third ratoon crop of Q.813 was seen at Mr. J. Pringle's farm. The entire district is very prosperous.

### Lower Burdekin.

At the Lower Burdekin district a fine crop is being harvested. Grubs are still causing trouble in parts of the district, although they have not been seen to any extent in the Haughton this year. This district being very much drier than the Northern cane areas is showing much higher commercial cane sugar. Many growers are obtaining averages of 15 and 16 per cent. already. The variety plot on Mr. G. Mackersie's farm was visited, and E.K.1, E.K.28, Q.813, Q.903, and the Tableland canes were found to be doing very well. The irrigation experiments with cane at the Home Hill State Farm were also visited, and new experiments laid down for the coming year. At the Inkerman Mill a very fine electric power-house has been built. The new machinery includes a suction gas plant of 240 h.p., with Bellis-Morcomb engines, which are used in connection with electric driver throughout the mill A new multitubular boiler has been erected. The mill expects a big crushing, and was putting cane through at the rate of 5,600 tons per week. Kalamia Mill was doing excellent work also, and a number of additions and improvements have been installed, the proprietors spending about £30,000 last year in increasing the efficiency of the mill.

On the Lower Burdekin areas quite a lot of B.208 is now being grown, Badila, unfortunately, having developed a good deal of top rot. Large areas of land have been recently planted and the young cane has struck remarkably well.

### Successful Field Days.

Highly successful field days were held at Bundaberg, Mackay, and South Johnstone Experiment Stations during the Director's tour. It is estimated that over 500 farmers attended the Bundaberg and Mackay field days, showing that these functions are becoming increasingly popular. Machinery demonstrations were given, in addition to particulars as to cane cultivation, and farmers generally displayed the keenest interest in the proceedings.

### Summary.

During his visit to the cane areas of North Queensland—*i.e.*, above Townsville—constant showery weather with warm temperatures was experienced. Contrasted with the cold dry heavy atmosphere of last year the change was very marked. At this time last year the sugar in the cane was very high. This year it is so far low in these

districts. This with the arrowing of the cane should have a steadying effect on the anticipated surplus which the Director does not now consider will be as large as originally expected. A preliminary revised approximate estimate will be issued in a few days. The most striking factor in North Queensland has been the increase in the capacity of the various mills during the recent agreements between the State and Federal Governments. It is estimated that quite £500,000 have been spent by existing mills in remodelling and additions to their sugar machinery. The growers also have not been behind, and some hundreds of tractors are now being used as well as improved farm machinery and fertilisers.

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## CANE PEST COMBAT AND CONTROL.

*The Director of the Bureau of Sugar Experiment Stations has received the following report (11th July, 1924) from the Entomologist at Meringa, Mr. E. Jarvis:—*

### Liberation of Tachinid Flies.

Mention was made in my last monthly report of a big emergence of tachinid flies at our Laboratory early in May, one hundred of which were forwarded to the Herbert River district for liberation among borer-infested cane.

These flies carried well in glass tubes, measuring 9 inches by 1¼ inches, closed with a moist wad of cotton wool; food being provided during the journey in the shape of small wafers of freshly cut sugar-cane. They were liberated by Mr. G. Bates about 1½ mile below Macknade Mill in a block of standover Clark's Seedling.

### Vegetable Parasite of Tachinid Flies.

Towards the end of May the entomogenous fungus (*Empusa* sp.) appeared in a large breeding-cage which contained about 300 specimens of *Ceromasia sphenophori*. Several dead flies were seen on the 21st instant adhering to mosquito-netting, leaves, &c., which, upon removal to a damp chamber, quickly developed a luxuriant growth of the conidiophores so characteristic of this interesting genus.

The spores or conidia, which are ejected in countless numbers from the threads that bear them, are able, when coming into contact with healthy flies during favourable atmospheric conditions, to germinate and ultimately destroy them in a few hours.

### Cane Grubs of the Herbert River District.

Wishing to ascertain which species of our Scarabæidæ are destructive to cane roots around Macknade, ploughs were followed on various selections, but, unfortunately, the grubs brought to the surface in this way proved to be those of the common grey-back (*Lepidoderma albohirtum* Waterh.), the "Christmas beetle" (*Anoplognathus boisduvali* Boisd.), *Lepidiota rothei* Blackb., and *Dasygnathus australis-dejeani* Mackl., all of which occur more or less plentifully in canefields of the Cairns district.

I was hoping to have come upon grubs of the so-called "Green beetle" of the Herbert River farmers, imagines of which are often collected during the flighting season and paid for at the rate of about 2s. per quart. This species is believed by some to be *Anoplognathus mastersi* Macl., a lovely metallic greenish-gold beetle about three quarters on an inch long. It is said to feed on the leaves of *Commersonia echinata*, and on bamboo.

Possibly, however, the grubs of either *A. punctulatum* Oliff. or *smaragdinus* Ohaus., both of which species are bright green, may be injurious to cane, the latter beetle having, indeed, been found commonly eating the foliage of *Hibiscus tiliaceous* growing freely along the banks of the river.

I am inclined to think *smaragdinus*, which is of a brilliant green colour, will ultimately prove to be the species in question, as *mastersi* is uniformly golden, the greenish flush not being sufficiently marked to attract attention at first sight.

The term "Golden beetle," used on the Burdekin for one of their cane-beetles, is evidently applied there to the species which we call "Christmas beetle" in the Cairns district, viz., *Anoplognathus boisduvali* Boisd.

From data now obtained it may be gathered that *albohirtum* (grey-back) does most of the damage to cane on the Herbert; *boisduvali* coming second in economic importance, then *australis-dejeani*.

The occurrence of grubs of the last-mentioned species on seven different selections near Macknade is somewhat surprising, since this beetle, like other related dynastids, is known to subsist principally on vegetables, debris, humus, &c. In the Cairns district it is a minor cane pest, while *boisduvali* comes about third in importance, and *Lepidiota frenchi* Blackb. second.

**Experiments with Calcium Cyanide (continued).**

Following on our first experimentation last February with this insecticide—accounts of which were published in previous monthly reports (*see* "Australian Sugar Journal," Vol. XV., p. 708, and XVI., p. 66)—investigation of the possibilities of this form of cyanide as a controlling factor against cane grubs has been continued at our Laboratory. It may be mentioned here that calcium cyanide, when acted upon by watery vapour in the air, produces hydrocyanic acid and ordinary slaked lime, the former well-known product being an exceedingly deadly fumigant. Since reporting last, I have received samples of the nodular and flaked forms of this insecticide, the latter of which being cleaner to handle and taking longer to evaporate than other forms, appears to be the most suitable for our purpose.

During last April, thirty-six cages of moist soil, each containing a single third-stage larva of *albohirtum*, were treated with from 8 to 12 grains per cage of flaked calcium cyanide, placed about 3 inches above the grubs. When examined twenty-four hours later all specimens were found to be quite dead, and a strong odour of cyanide still pervaded the soil.

A dose of 10 grains applied 1 foot apart on both sides of the cane rows works out at about 30 lb. of the insecticide per acre, and if found effective in field practice it would be cheaper than either para-dichlor. or carbon bisulphide.

Preliminary tests were applied during May to determine the effect of calcium cyanide on growing cane roots. Up to the present the outlook in this connection certainly looks promising.

Three cane stools about 1 foot high growing in the open were injected on each side with 20-grain doses of the flaked form, placed 6 inches from stools and 3 inches deep. This double dose (at rate of 60 lb. per acre) had no effect whatever, either on the leaves or growth of these plants.

Later, in a field experiment carried out on 16th June, four young plants of Badila from 9 to 12 inches high were treated with 40-grain doses (20 grains on each side), 6 inches from plants, and sprinkled in the soil at a depth of 6 inches, each dose occupying a space of about 8 square inches. The next four plants in the same row of cane were left as controls; while the four plants adjoining this check received similar treatment to the first four, but were given 60-grain doses per plant. When examined forty-eight hours later, both the growth and appearance of treated and check plants had remained perfectly normal throughout the experiment, and no odour of cyanide could be detected in the soil around injections. When looked at eight days after treatment all plants in the row had made equal growth.

**Success of Para-dichlor. as a Grub Fumigant.**

The various experiment plots treated with para-dichlor. this season have again yielded interesting data. Although grubs have not been very plentiful anywhere, some of these plots were laid out in grub-infested canefields. On such areas the stools on blocks treated last January with this fumigant have remained standing erect and perfectly green, in marked contrast to cane on adjoining check plots, which commenced to go yellow about two months ago, and in some cases has fallen over. Much of this grub-eaten cane would have died altogether, had not intermittent showers and cloudy days enabled it to produce a few fresh heartleaves and roots.

On plots of Badila, D.1135, and Clark's Seedling, free from grub attack, which were injected with varying doses of para-dichlor. (1/16th to ¼ oz.) testing its action on the growth of young ratoon and plant cane, the result in all cases has demonstrated that this fumigant does not in any way injure the plants; there being no difference whatever in height or colour between rows of treated and check stools.

The above results, obtained in more or less striking degree during this season and last year, wherever grubs have been present, afford conclusive proof of the insecticidal value of para-dichlor. as a remedy for this cane pest.

When, as was the case last April, stools that had been injected with ¼-oz. doses three months earlier were plainly seen from a distance of a quarter of a mile standing out as a dark-green strip amongst a patch of yellow grub-eaten cane, one is forced to believe the fumigant used to be the controlling agent.

# THE FEEDING VALUE OF MAIZE GRAIN.*

## ITS UTILISATION WHEN CHEAP.

By H. WENHOLZ, B.Ag.Sc.

Maize ranks high amongst grains in value for feeding purposes, firstly, because of its large precentage of digestible nutrients, secondly, because of its high palatability, and, thirdly, at the present time because of its comparative cheapness.

The prospect of the present Australian crop, which has largely been already harvested, is such that it is the largest which has been in sight for many years, and with the country generally facing better conditions than for some time, and the consequent falling off in the demand for maize on this account, the price of maize has dropped to about 4s. per bushel, which is about the lowest level it has reached for many years. Many farmers are, therefore, finding themselves in such a position that the present market price offers little margin above the cost of production.

In this article an attempt will be made to show farmers how better prices may be realised for their crop in years such as this, when there is a surplus production.

The grain of maize contains roughly 70 per cent. carbohydrates matter, 10 per cent. protein, and 5 per cent. fat. The high percentage of carbohydrates and fat explain the heat-forming and warmth-producing nature of the food, and its high percentage of digestible nutrients, 95 per cent. of carbohydrates, 76 per cent. of protein, and 85 per cent. of fat make it a very economical food for stock.

The United States of America produces annually about 3,000,000,000 bushels of maize from 100,000,000 acres, and of this huge crop more than 80 per cent. is utilised for feeding to stock largely on the farm, where it is grown, which usually represents a more profitable method of marketing, "making the maize walk to market on four legs."

### Maize as Feed for Pigs.

Of the enormous American crop about 40 per cent. is consumed by pigs, for which animals maize is particularly good in view of their limited digestive capacity and the consequent inability to consume a large quantity of bulky, fibrous food.

It is for the final fattening or topping up of pigs that maize is so valuable. Store pigs put on weight rapidly when maize is fed to them, and the prime quality of porkers or baconers "corn fed" is well known.

For growing pigs maize requires further supplementing with proteins or muscle-forming constituents and ash or bone forming materials in which it is largely deficient.

Being a heating and fat producing food, maize should be used very sparingly to brood sows before farrowing, but after farrowing and during the suckling of the young pigs, maize can be used with advantage if supplemented with other foods to supply protein and with materials for bone production.

The Australian farmer usually appreciates the value of maize for pig feeding, and is little if any behind his American cousin in this respect, and many are fortunate this season in having made provision for turning cheap maize into rather good-priced pork and bacon. For those unfortunate farmers who are not sufficiently foreseeing, store pigs are probably now mostly too dear to buy, and this use of cheap maize is denied them. But another time it is advised to look well ahead for these periods of plentiful maize and arrange for them by having many pigs on hand.

### Utilising Maize as Feed for Dairy Cows.

By far the greatest remaining portion of the American crop is fed to dairy cows, but strangely maize has been scarcely yet recognised as a valuable feed by the dairy farmers of Australia. Yet those few who have become acquainted with its high value for this purpose were found to be feeding it when maize was 10s. per bushel a few years ago, rather than dispose of it direct on the grain market. This is sufficient tribute to its value.

It must be remembered that maize is largely a carbonaceous food, and that it lacks the protein and also the mineral matter necessary for milk production. The maize, therefore, requires to be supplemented with other concentrates, such as bran or oil

* In "Australian Farming" for July.

cake. For average cows about 2 lb. of ground or cracked maize, together with 2 lb. bran or linseed meal, added to the ordinary ration of silage and lucerne hay gives excellent results, and these qualities can be further increased with profit for the better producing individuals of the herd.

For beef-cattle at present low prices, the feeding of maize grain may not be desirable, but experience has yet to be gained in the utilisation of maize as a topping feed to get quick results and good quality just prior to marketing as "fats." Feeding whole grain to cattle is somewhat wasteful, unless they are followed up by pigs to consume the large quantity voided in the manure.

### Maize as Feed for Sheep.

The feeding of maize to sheep in times of drought is a well-known and largely practised method of utilisation of maize grain in Australia, which probably leads the world in recognising its high value in this respect. A few ounces of maize per sheep per day, supplemented by rough feed, even such as lopped scrub in the Western country, has been the salvation of many a flock of sheep during drought periods.

It is an anomaly, however, that maize should only be recognised as a good feed during such times of stress, and that no attention should be paid to it by the grazier as a supplementary feed in normal times when maize can be bought cheaply. The finishing of lambs and mutton on cheap maize at the present good prices of this class of meat should at least commend itself to many. For breeding ewes, maize should be withheld from the ration owing to its constipative effect, and also because it tends to lay on internal fat, but after lambing maize is ideal in promoting a good flow of milk for the young lambs. It is certain that far more thrifty, healthy, and quick growing lambs are raised if the milk supply of the ewes can be well maintained, and maize certainly assists considerably in this.

### Maize as Feed for Horses.

Maize is one of the best feeds for horses, and is generally well utilised on them on most farms where maize is grown. Because of its high warmth-producing qualities maize is superior to other grains for horse feeding during the winter months. Being highly digestible, it provides a large amount of energy for horses doing long hours of arduous work. It is also particularly palatable, and with its starches readily convertible into sugars is an easy assimilable food.

Provided maize is balanced with some feed supplying protein, such as lucerne hay, it may form a large part of the grain fed to horses. It is best cracked for horses, as it is not desirable to expend a large amount of the horse's energy in the preparation of its food.

When maize is cheap and there is a tendency to use large amounts in the horse feed on the farm, and particularly in the coastal districts where little hay is grown, it will be an advantage to lighten the mass of grain in the horse's stomach. The husk of oats serves this purpose well when oats is the grain feed, and wheat bran is probably one of the best mixtures with maize to serve this end. The grinding of the whole cob of maize may also be done with good effect under these conditions.

### Utilising Cheap Maize for Poultry Feed.

The utilisation of maize by suburban poultrymen is fairly general during most periods of the year, but mostly and rightly so during the winter months. Maize is very palatable to poultry, and many farmers have observed a sudden increase in their egg production when the new season's maize comes in on the farm.

The farm poultry flock is not usually a well-tended concern, and there is little doubt that in these years of cheap maize the farmer could very well give them more attention. The keeping of poultry in larger numbers and their systematic feeding for meat production will possibly indirectly double or treble the price received for cheap maize on the market, especially when the saving on the family bill for meat (for which cash is often outlayed) is considered.

### Conclusion.

It is no use the farmer complaining of a poor price for maize when he has mostly the remedy in his own hands for securing indirectly a better price for his product. By a little foresight in increasing the number of some kinds of stock on the farm in seasons of low-priced maize, and the more general utilisation of this maize to the usual stock on the farm, it is likely that the large crop can be consumed at the rate of several bushels daily, and a far more satisfactory price secured for its indirect sale in this way.

## ABSTRACTS AND REVIEWS.

*All foreign agricultural intelligence in this section, unless otherwise stated, has been taken from "The International Review of the Science and Practice of Agriculture" and the "International Review of Agricultural Economics," published at Rome by the International Institute of Agriculture.*

### The Co-operative Cotton Marketing Movement.

"International Cotton Bulletin," Nos. 5, 6, Manchester, September, December, 1923. "Statist," Vol. CII., No. 2,387, London, 24th November, 1923. "Manchester Guardian Commercial," Vol. VII., No. 20, Manchester, 15th November, 1923. "Oklahoma Cotton Grower," Vol. III., Nos. 21, 22, Oklahoma City, 10th and 25th November, 1923. "California Cultivator," Vol. LXI., No. 22, Los Angeles, 1st December, 1923.

The cotton growers' co-operative movement in the United States has been called into being as a result of the very low prices which farmers received for their raw cotton. Owing to the farmers' lack of knowledge, both regarding the quality and grade of the cotton which they had grown and regarding prices and general market conditions, and to the fact that competition between buyers of cotton did not establish correct values, the farmers were at a great disadvantage in the marketing of their crop. Farmers, moreover, were forced to sell their cotton immediately after harvest in order to meet their liabilities, for only 12 per cent. of the farmers in the cotton and tobacco districts of the United States are able to finance their own crop-raising. Thus, though the world-consumption of American cotton is nearly constant from month to month, varying only from 7·9 per cent. in the month of November to 8·9 per cent. in the month of March, yet 70 per cent. of the American cotton crop was sold by farmers during the four months September-December. An investigation by Government officials showed that, as a result of the selling methods practised, "the prices of cotton of the same grade and staple vary as much as 10 dollars and more per bale, and, still more important, the better grades and longer staples are bought at from 35 dollars to 50 dollars below their market values."

Under such conditions the cotton growers' co-operative movement was initiated between two and three years ago. The Department of Agriculture has taken great interest in promoting the organisation of the co-operative societies on a sound basis. It was first necessary, however, for legislation to be obtained enabling the farmers to combine. The passing of the Warehouse Act, the revival of the War Finance Corporation and the direction of its attention to the assistance of agriculture, and the passing of the Capper-Volstead Act, exempting agricultural organisations from complying with the provisions of the Sherman Anti-Trust Law, have been very important factors in making the co-operative movement possible on a large scale. The War Finance Corporation, for example, has approved the application of the South Carolina Cotton Growers' Co-operative Association for an advance of not exceeding 5,000,000 dollars to finance the orderly marketing of cotton during the 1923-1924 season. Over 20 per cent. of the cotton grown in the United States is marketed by farmers' co-operative associations.

Farmers who become members of one of the co-operative associations sign a legal contract under which they agree to deliver all their cotton for sale through the association for a period of five or seven years. The societies have no capital to begin with, but the banks make advances to them on the cotton which they hold.* On delivery of his cotton to the society a farmer receives an advance from the society equal to 60 per cent. of the value of the cotton; the society retains from 1 to 3 per cent. of the gross value for the formation of a reserve fund. The cotton is pooled, and when the whole of the pool has been sold the farmer receives the balance of the full payment due to him. A grower who owns any cotton, even a single bale of a superior quality, is paid an adequate price for it. Under the internal pooling system of the associations each member receives the same price for the same quality and grade of cotton regardless of the time of delivery or sale.

The societies are not allowed to hold cotton back in order to obtain higher prices, but must sell some each month no matter what the price may be. By this means

* The Federal Intermediate Credit Banks, established under the Agricultural Credits Act, 1923, are now also making loans to co-operate cotton marketing associations on the security of warehouse receipts.

a more or less average price over the whole year is obtained, and it is anticipated that this practice will lead to the stabilisation of prices. The amount of cotton to be sold each month is not fixed.

Societies may offer for sale only that cotton which they have actually in their warehouses. They may not go into the market to fill an order but must sell on samples which they hold.

Under the co-operative marketing plan country-damaged cotton is practically non-existent owing to the fact that the banks will not make an advance to a society unless its cotton is immediately brought into a first-class warehouse. The societies do not possess their own warehouses but use any public warehouse of good construction.

The organisation built up by the associations for obtaining large amounts of cotton is complete, but it is required to build up further the organisation for the disposal of the cotton. There are twelve State-wide cotton growers' co-operative associations in the American cotton belt, and although they have been working for only two complete years they have a combined membership of 225,613 farmers. In 1921-1922 the associations sold 354,000 bales of cotton; in 1922-1923 they sold 800,000 bales, whilst for 1923-1924 it is hoped that the amount sold by the associations will be not less than 1,500,000 bales.

These twelve associations comprise the States of North Carolina, South Carolina, Georgia, Mississippi, Alabama, Tennessee, Oklahoma, Arkansas, Texas, Louisiana, Arizona, and Missouri. Their progress is continuing. During the past season their new members numbered 81,973; of this number 24,318 were in Georgia, 15,495 in Oklahoma, and 10,094 in Texas. The Oklahoma Association, with a membership of 50,362 has the largest number of members. All of the associations have received a great deal more cotton this season than last. The Texas Association, for example, which in 1922 received 78,000 bales had up to 20th October, 1923, already received 121,000 bales, and the South Carolina Association was expecting to increase by 25 per cent. its total for the previous year of 40,000 bales.

The twelve State associations are federated in the American Cotton Growers' Exchange, which is their central selling organisation, having its selling offices in Atlanta, Georgia, and its administration offices in Dallas, Texas.

### The Laws of Heredity and the Breeding of Farm Animals.

Hunt, W. D., "New Zealand Journal of Agriculture," Vol. XXVII., No. 2.

The author draws attention to the importance of the stock breeder possessing marked ability in the selection of animals, as well as a knowledge of the laws of heredity.

The following is a brief record of results obtained by J. Gibson the well-known Tasmanian breeder of Merino sheep which are grown almost entirely for wool, the desire being to produce a sheep that would give the greatest amount of the best quality of wool. In 1868, he bred the ram "Sir Thomas" the most noted Merino of his time; the heaviest fleece cut from this ram for twelve months' growth was 12 lb. The descendants of "Sir Thomas" given in order gave fleeces of the following weights respectively:—14 lb., 17 lb., 18 lb., 20 lb., 26 lb., 23 lb., 27 lb., 30 lb., 36¾ lb.

Thus, in a little over thirty years by selecting those variations showing increased weight of wool, the weight was increased from 12 lb. to 36¾ lb., and this was done entirely within the flock without bringing in any outside blood.

The discoveries of Mendel serve to explain the reason for many results, as for example, the fact that red calves sometimes appear in pure herds of black Aberdeen-Angus cattle. Black and red are Mendelian characters and black is dominant and red recessive, hence the result of crossing a black animal with a red would be a black animal although such a calf would carry in its germ-cells the factor for red. From the above it will be seen that, before a red calf can appear in a black herd, both sire and dam must carry the factor for red; further, that if one animal were introduced into a herd which although itself black, carried the factor for red, it would be possible in time for red animals to appear. The only way to make sure of keeping red out of a black herd is as follows:—

(*a*) Before introducing a new bull into a herd, test it with red or red-and-white cows. If the bull is a pure black, all the calves will be black; if it carries the factor for red about half the calves will be red.

(*b*) Note results from bulls bred in the herd when used in cross-bred herds. If any calves are red, the bull carries the red factor. If the sire of the bull has been proved pure the red factor must have come from his dam, and the dam should be removed from the herd.

(*c*) If a red calf is born in a pure black herd the sire and dam must both carry the red factor, and both should be removed from the herd.

Every breeder will be trying constantly to bring his flock or herd nearer to his ideal. In order to do this he can use sires of type and ancestry as near to his ideal as he can get them, or he can select with a view to correcting some weakness in his own animals—that is, if his animals have gone to an extreme in one direction he can try to correct this by using sires that go to an extreme in the other direction.

The author considers that the first method is the best, as although the second method may produce animals of satisfactory appearance, they will not breed true.

To breed true the animals must have uniform germ-cells all carrying the same inheritance-factors. With an outcross there is always the danger of introducing germ-cells carying the factor for some fault that may prove afterwards very difficult to eliminate, but experience has shown that animals which have been closely inbred for some time, respond quickly to an outcross.

The above consideration brings up the question whether the best plan in a large stud is not to divide the stud into several families and to closely inbreed each within itself until weakness appears; then introduce a sire from one of the other inbred families, and continue the inbreeding until another outcross is required, when another family can be used.

Another important matter when establishing a stud is that of location. Animals can be altered by environment and changes should all be in the direction of strengthening the type for the class of country in which they will live, or to which they will have to adapt themselves if sold. The location should be one where the conditions are such that natural selection will eliminate any individual unable to thrive under the conditions of the sires bred in the stud, where they are likely to be placed when sold.

### Milk for Young Chicks.

Delmas, F., "La Vie Agricole et Rurale," Vol. XXIII., No. 30, pp. 66-69. Paris, 1923.

With the object of ascertaining whether giving milk to young chicks would prevent the great losses that frequently occur in very young broods, especially when they belong to the Mediterranean breeds, the author made experiments with forty-two Leghorn chickens (of the white and brown varieties) that had been hatched on the same day. The chickens were divided into two lots each of twenty-one birds. The first lot was given milk with the addition of one-third water and weighed 987 gms., while the second had only water to drink and weighed 994 gms. Both lots were otherwise fed exactly alike. The chicks drank the milk-and-water with avidity. The experiment was continued for two months, and the results obtained were indisputable; in the first lot, only two chickens died, whereas the number of deaths in the second was six.

These results were confirmed by experiments conducted on vitamines, and if vitamines A (antirachitis) is deficient in the food ration of chicks it should be introduced into the average ration, even if the ration contains sufficient vitamine B (antineuritic) from the liberal grain supply, and also plenty of vitamines C (antiscorbutic) which can be obtained from green food.

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## MAIZE ON THE DOWNS.

Some good maize yields are reported from the Downs. In the Yangan district there was harvested a crop of 250 bags from a measured paddock of 10 acres 7½ square chains, which works out at 23¼ bags per acre. This was grown by Mr W. R. Canning, on what was not generally looked upon as very good land, but which, undoubtedly, has benefited from the spell it has had. Some excellent samples of yellow maize have been shown by Mr. A. A. D. Clarson from his farm at Yangan. The samples were excellent types of Star Leaming yellow maize, the cobs being not only very large, but uniform and compact. One of the samples measures 11½ in. in length, 8½ in. at the butt, 6 in. at the other end, and weighed 1 lb. 8 oz. The number of rows of grain was twenty-four. The second sample was 8½ in. long, 8½ in. at the butt, and 6¾ in. at the end, containing twenty-two rows. The seed was purchased from the Department of Agriculture, and was planted during the second week of December. Mr. Clarson has 6 acres of this particular variety, and has also another good yield of Funk's Yellow Dent variety, the seed of which was also obtained from the same source.

# THE DENTITION OF THE PIG.

## HOW TO TELL THE CORRECT AGE.

E. J. SHELTON, H.D.A., Instructor in Pig Raising.

It is unfortunate that sometimes the pig farmer, or rather the breeder of stud pigs who exhibits his pigs at our leading Agricultural Shows, is eyed with considerable suspicion by his fellow breeders when he offers for exhibition and sale certain pigs (they might be active, vigorous males or comely, polished females) which to the average ringsider are apparently "well over the age" stipulated in the show schedules or sale catalogues for the particular class in which the pigs are entered.

The writer has on several occasions when judging at the larger shows had occasion to disqualify a number of pigs for this reason, much, of course, to the annoyance of the exhibitor concerned, but also frequently to the entire satisfaction of those who are honestly trying to build up a herd on correct lines, and to run straight, to play the game, and to follow the adage, "Honesty is the best policy."

Only quite recently in discussing the matter with a prominent exhibitor at a Southern show, the following remarks were passed. The question the writer asked was on these lines: "Now, Mr. ———, to be perfectly fair and square, or as our Queensland boys will have it, to be 'Dinki Di,' aren't you sure these pigs are over age?" This put the exhibitor right up against the wall, as a reasonably attractive figure was offering for the pigs under review, if everything was "O.K." "Oh, well, Mr. Shelton," said the exhibitor: "It's this way. You can see for yourself what's going on all around these pens, and if I want to win I've got to do the same as the other fellow is doing."

Now these remarks are not intended to cast aspersion on any particular exhibitor or group of exhibitors, or even to suggest that malpractices are being followed—they are merely introductory and to call attention to the necessity of some better system being put into operation; though even by a most careful study of a dentition chart and a deliberate attempt to follow this out to the letter, it will not always be possible to arrive at an absolute certainty as to age, for the class and condition of the feed used and the environment generally, doubtless, will have their effect on the pigs' teeth just the same as happens in the case of horses, cattle, and sheep.

The Council of the Royal Agricultural Society of New South Wales some two or three years ago, in attempting to overcome what was apparently an attempt at unfair competition on the part of some exhibitors of stud pigs, followed the lead set by several British Societies, and inserted in their Stud Pig Schedules the following regulations.

"Should any question arise as to the age of any exhibit in the pig classes, the stewards shall, at the request of the judge, have the state of their dentition examined by a competent authority. If the state of dentition shall indicate that the age of any pig does not agree with the dentition test, the stewards shall report the same to the Council, who shall have power to disqualify such pig or pigs.

The following is the state of dentition in pigs which will be considered as indicating that they exceed the ages specified below:—

*Six Months.*—Pigs having their corner permanent incisors cut, will be considered as exceeding this age.

*Nine Months.*—Pigs having their permanent tusks more than half up, will be considered as exceeding this age.

*Twelve Months.*—Pigs having their central permanent incisors up and any of the three first permanent molars cut, will be considered as exceeding this age.

*Fifteen Months.*—Pigs having their lateral temporary incisors shed and the permanents appearing, will be considered as exceeding this age.

*Eighteen Months.*—Pigs having their lateral permanent incisors fully up, will be considered as exceeding this age.

From the above and from a study of the accompanying illustrations it will be observed that there are several groups of teeth in the pig's mouth, though it is by no means an easy task to make a careful examination of same. In his very precise description of these teeth, Sir G. T. Browne, in his manual on "The Pig," has the following to say:—When dentition is perfect the pig has six incisor teeth in the front of both upper and lower jaws—two central, two lateral, and two corner teeth. Behind the corner teeth are the tusks, one on each side in the upper and lower jaws. Between the tusks and the molar teeth there are usually four small teeth which are described as pre-molars, one on each side of both jaws; and twenty-four molars, six on each side of the upper and lower jaws.

Temporary and permanent incisors agree generally in number, form, and position, but the temporary molars are only three in number on each side of the upper and lower jaws, and the third molar has three cusps instead of two. The temporary tusks are much smaller and more pointed than the permanent teeth which replace them, and the pre-molars are not represented by temporary teeth, but are permanent from the first. It may be observed that no difficulty is found by the experts in distinguishing the permanent incisors from the temporary organs, especially when both orders are in the mouth together. This distinction is not, however, so marked as to secure the tyro from risk of error.

At birth (Fig. 1) the pig has two sharp-pointed teeth laterally placed in each jaw, top and bottom, leaving an open space in the front of the mouth. The teeth much

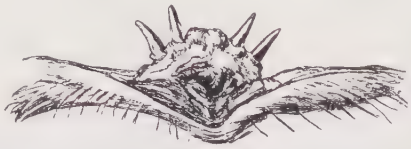


Fig. 1.—Teeth of Pig at Birth.

resemble small tusks; they are really the temporary tusk and corner incisor. No other teeth are in the mouth at the time of birth; but the temporary molars are immediately under the gum, and in the dried specimen they can be distinctly seen in their relative positions.

At one month old the three temporary molars on each side of the jaw, top and bottom, are cut, the second and third in position being well up, the first one just appearing through the gum; at the same time the two central temporary incisors in each jaw are cut, as shown in the illustration (Fig. 2).

A. In Bone.

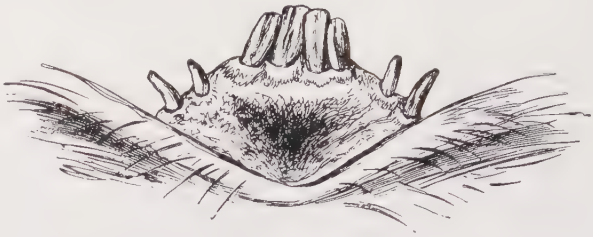
B. Molars.

Fig. 2.—Incisors and Molars of Pig at One Month.

At two months old the temporary central incisors are fully developed, and there are signs of the eruption of the lateral temporary incisors, which generally pierce the gums soon after two months. The first temporary molar is now nearly level with the second.

At three months old the pig has the temporary set of teeth fully developed, the lateral incisors by this time being nearly level with the centrals. The temporary corner teeth and the tusks are further removed from each other than they were at birth, owing to the growth of the jaw. In Fig. 3 the state of the teeth at three months old is indicated.

Excepting the natural growth of the jaws, in common with other parts, no changes occur which will assist the examiner in judging the age of the young pigs until the age of five months is reached. At this time there are evident signs of the cutting of the pre-molars; and the fourth molar, which is the first permanent tooth, is seen behind the temporary teeth.



A. INCISORS.

B. MOLARS.

FIG. 3.—INCISORS AND MOLARS OF PIG AT THREE MONTHS.

The illustration (Fig. 4) shows the state of the molars at the age of six months.

The author then states that, as a large number of pigs are entered at Agricultural Exhibitions at the age of between five and six months, it is necessary to devote particular attention to the signs which are exhibited by the teeth of the pig at this period, and the inspector is particularly required to remember that the animal which he is inspecting may be actually over the stated age at the time of inspection without in consequence being liable to disqualification. This condition of things constantly occurs at the shows which are held after the date up to which the ages are calculated. It is obviously necessary to add the days or weeks which have elapsed to the animal's certified age at the time of making the examination. For example, in cases where ages are calculated to the 1st of June, while the show takes place early in July, a pig which is certified to be five months three weeks and five days old in the class for animals not exceeding six months will be more than a month over the certified age when it is seen by the inspector.

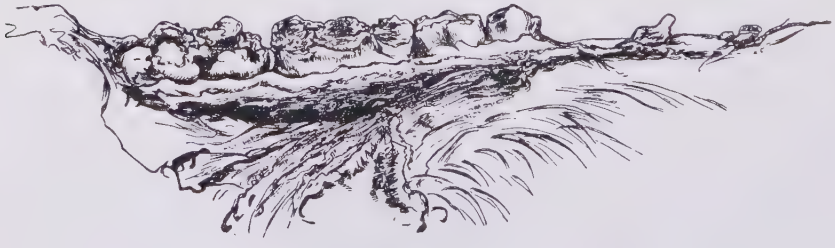


FIG. 4.—MOLARS OF PIG AT SIX MONTHS.

Again, it must be noted that the pre-molars are not always developed, and in the same litters, one or two pigs will be found occasionally in which this tooth is absent. The fourth molar is, however, remarkably regular in its appearance, and may be referred to for the purpose of solving any doubt which may arise in consequence of the absence of the pre-molars.

Disqualification of a pig or pigs entered as not exceeding six months would occur under such circumstances as the following:—

The inspector, it may be supposed, is examining the teeth of a pig which is entered as five months and two days; he adds the weeks which have elapsed since the date up to which the age is calculated, and deals with the animal as having arrived at the age of six months and nine days.

At this period he expects to find the pre-molars and the fourth molar well up, the fourth molar being close to the angle of the jaw and scarcely free from the covering of gum at the extreme posterior part. But if the fourth molar stands out from the angle of the jaw, leaving space behind it, and if he observes in addition that the temporary corners have been changed for permanents, he does not hesitate to assert that the pig is at least a month older than it is certified to be. In some cases the corner permanents are found with their points through the gum at seven months, but in many cases the temporary organs remain till the animal has reached the age of eight months.

Disqualifications in the six months old class are often very numerous (at English Shows), the pigs are shown as close to the age as possible, and the frequent presence of the corner teeth in pigs belonging to certain exhibitors is the cause of the animals being rejected.

Fig. 5.—Molars of Pig at Nine Months.

At nine months the corner permanent teeth are well up, and the permanent tusks may be through the gum in very forward animals at this age. In looking over the notes of the inspections which have been made for many years past, it is shown that, as a rule, the pig at the age of nine months has one or two of the temporary tusks still in position; in fact, the presence of well-developed permanent tusks in a pig entered as not exceeding nine months would be a fair ground of disqualification. The drawings (Figs. 5 and 6) show the state of the teeth at nine months.

Fig. 6.—Temporary Incisors and Tusks of Pig at Nine Months.

A class for pigs not exceeding nine months of age at many shows takes the place of the six months class, and, therefore, includes pigs of various ages from two or three months to over eight months. Disqualification in this class generally affects pigs which are really under nine months, in which the state of the dentition indicates the age to be above that which is stated in the (entry) certificate.

If, for instance, a pig which is entered in this class as five months and two weeks has the corner teeth just cut, or one entered as six months and twenty-one days shows evidence of the changing of the temporary tusks, in these cases no hesitation is felt in disqualifying the animals, although in both cases the animals are below the limit of age in the class in which they are entered.

One year old is the age when, according to received opinions, the central permanent incisors are cut. It is, however, more often seen that the temporary incisors are still in their places in pigs which are just under the age of one year, and although the permanent teeth when cut advance very rapidly, a pig entered as not exceeding one year would be looked upon with much suspicion if the central permanent incisors were found to be cut; and if they were well up and some of the anterior temporary molars had fallen and the permanent teeth were filling their places, the animal would be disqualified.

The fifth molar tooth is always cut between ten and twelve months, and its perfect eruption may be taken as evidence that the pig has reached the age of one year. In the illustration (Fig. 7) the recently cut central incisors are shown—a state of dentition which is seen only in very forward animals at the completion of one year of age.

FIG. 7.—CENTRAL PERMANENT INCISORS AND TUSKS OF PIG AT ONE YEAR (EARLY DENTITION).

Shortly after the completion of one year the three anterior temporary molars fall irregularly, and by the time the animal is fifteen months old the three anterior permanent molars are in the mouth, and may readily be known by their sharp, unworn points and their recent appearance, as shown in the next illustration (Fig. 8). These

Fig. 8.—Teeth of Pig at Fifteen Months; the three permanent anterior Molars recently cut.

teeth are very regular in their development and afford valuable evidence in cases where an opinion cannot be formed from an inspection of the incisors alone.

The next change in the dentition is the final one, and occurs between the age of seventeen and eighteen months. At this period the sixth molar, a permanent tooth, is cut, and in forward animals the lateral temporary incisors are changed for permanent teeth. In many instances the temporary lateral teeth remain up to the age of eighteen months, although they are in such cases quite loose, and very often the permanent teeth are cutting through the gum below or by the side of them; in other instances one lateral is found to be fully up and nearly level with the centrals, while the other is just pushing through the gums. The sixth molar also is fairly well up, but the posterior part of its crown is not quite clear from the gum. These changes

complete the permanent dentition of the pig, and there are no indications of the age afforded by the teeth after this period excepting such as depend on the growth and wear of the organs.

In Fig. 9, the sixth molar is shown as it appears at the completion of the age of eighteen months.

FIG. 9.—MOLARS OF PIG AT EIGHTEEN MONTHS, SIXTH MOLAR WELL UP.

It is very important that the examiner should exercise the greatest care in the inspection of the teeth of pigs which are exhibited in the class above twelve and not exceeding eighteen months old. Animals are entered at various ages from twelve to eighteen months; it is necessary, therefore, in this class to note the condition of the central incisors and the anterior molars as well as that of the lateral incisors and the sixth molar. In Fig. 10 the full development of the lateral permanent incisors is shown. This state of dentition, it may be remarked, is indicative of a year and eight months.

At the age of two years the lateral permanent incisors are quite level with the centrals, and are worn on their edges; the sixth molar now stands quite free from contact with the angle of the jaw, and indications of wear may be observed on the upper surface of the other molars. After the pig has attained the age of two years, an opinion as to the age must be to a great extent speculative. The wear which the teeth undergo, the darkening of their colour, and the growth of the tusks, will afford some evidence which will assist the judgment, but there are no changes which can be referred to as indicative of the exact age of the pig after the lateral incisors and the six molars are fully developed.

In the course of the above remarks on the changes which occur in the teeth of the pig at different ages, certain exceptions to the rule of development have been mentioned. They are not numerous, nor very important in their bearings, and it is a subject of common remark that the exceptions are nearly always in favour of the exhibitor, being in the direction of retarded rather than accelerated development.

It may be useful to say a final word in reference to a common mistake into which exhibitors, or rather their servants, frequently fall—*i.e.*, the error of believing that a little discrepancy between the state of dentition and the certified age of an animal is not of much consequence, so long as the age does not exceed the limit of the class in which the animal is entered. The teeth are inspected with a view to ascertaining if they agree with the statement of the age in the certificate of entry, and not for the purpose of insuring that the animal is within the age to which the class is limited."

In New South Wales and Queensland the Councils of the Royal and Royal National Shows decided in order to avoid as much trouble as possible to require that the age of all pigs entered is to be calculated to the day of judging. This certainly is a great advantage, both from the standpoint of exhibitor, judge, and the general public, but so far no attempt has been made to apply the dentition tests even to pigs that have been disqualified. Still it is felt, seeing that at Southern shows the matter is a very live one, Queensland breeders should have the advantage of all the information available on this important subject. It is one that will be discussed at the Annual

Meeting of the Queensland Branch of the Berkshire and Yorkshire Society to be held at Affleck House on the Show Ground, on 13th August, at 10.30 a.m., as well as at the Annual General Meeting of the Federal Council and of members to be held during the currency of the Melbourne Show in September.

Fig. 10.—Incisors and Tusks of Pig at One Year and Eight Months; lateral permanent Incisors well up.

## EXPORT OF PORK PRODUCTS FROM AMERICA.

The export of pork products from the United States of America has declined rapidly during recent months. In the case of lard, this decrease is due in part to the increased slaughter of pigs in Germany. With the stabilisation of the currency and the imposition of increased taxes German farmers have been marketing pigs much more rapidly than last year, and since the number of pigs in Germany is reported to be 2,750,000 greater than last year there is a possibility of the continuance of a greater domestic supply of pork products; this is likely to have an effect on the export markets.

# FRUIT FLY INVESTIGATIONS.

## ENTOMOLOGIST'S REPORT.

Report for June, 1924, on Fruit Fly investigations combining April, May, and June, by Mr. Hubert Jarvis, State Entomologist, Stanthorpe district, made available for publication by the Minister for Agriculture and Stock (Hon. W. N. Gillies).

### Fruit Fly *(C. tryoni)*.

During April the Queensland Fruit Fly (*Chætodacus tryoni*, Froggatt) was still active, and could be seen on the wing during the warmer hours of the day in sheltered situations. On 8th April, several fruit flies were observed by Inspector J. Henderson and myself, flying around and alighting on passion vine fruit and foliage in the Stanthorpe area, but a trap at once placed on the passion vine failed to catch any flies. On 12th May, Mr. J. O'Halloran (The Summit) observed fruit flies alighting on a heap of pumpkins and melons. He trapped a number of these flies, and submitted them to this office, and they proved (with one exception) to be examples of the Queensland Fruit Fly (*C. tryoni*). This is the latest record of adult fruit fly occurrence in the field in this district.

The following are the Insectary records of maggot pupation and fly emergence during May and June:—

During the above period the maximum soil temperature taken at a depth of 2-3 in. was 60 deg. Fahr., and the minimum 40 deg. Fahr. (*Note.*—Minimum temperatures were taken at sunrise, and maximum at midday.)

| Date of Emergence. | Approximate Date of Pupation. | Number Hatched. | Species. | Host-Fruit. |
|---|---|---|---|---|
| 5th May, 1924 .. | 29th April, 1924 .. | 24 | *C. tryoni* | Pear |
| 7th May, 1924 .. | 22nd April, 1924 .. | 4 | *C. tryoni* | Pear |
| 10th May, 1924 .. | 7–12th April, 1924 | 10 | *C. tryoni* | Quince |
| 12th May, 1924 .. | 12th April, 1924 .. | 15 | *C. tryoni* | Pear |
| 13th May, 1924 .. | 12th April, 1924 .. | 14 | *C. tryoni* | Pear |
| 14th May, 1924 .. | 10th April, 1924 .. | 6 | *C. tryoni* | Pear |
| 15th May, 1924 .. | 10th April, 1924 .. | 19 | *C. tryoni* | Quince |
| 16th May, 1924 .. | 10th April, 1924 .. | 14 | *C. tryoni* | Pear and quince |
| 17th May, 1924 .. | 15th April, 1924 .. | 10 | *C. tryoni* | Pear and quince |
| 20th May, 1924 .. | 15th April, 1924 .. | 3 | *C. tryoni* | Pear and quince |
| 21st May, 1924 .. | 12th April, 1924 .. | 12 | *C. tryoni* | Pear and quince |
| 23rd May, 1924 .. | 15th April, 1224 .. | 7 | *C. tryoni* | Quince |
| 26th May, 1924 .. | 12th April, 1924 .. | 4 | *C. tryoni* | Pear and quince |
| 29th May, 1924 .. | 12th April, 1924 .. | 2 | *C. tryoni* | Pear and quince |
| 2nd June, 1924 .. | 23rd April, 1924 .. | 2 | *C. tryoni* | Pear and quince |
| 4th June, 1924 .. | 23rd April, 1924 .. | 2 | *C. tryoni* | Pear and quince |
| 15th June, 1924 .. | 15th April, 1924 .. | 2 | *C. tryoni* | Pear and quince |

FRUIT FLY—HATCHINGS IN CAGES CONTAINING INFESTED FRUIT IN THE FIELD ARE AS FOLLOW:—

| Date of Emergence. | Date Cage was Placed. | Locality. | No. Hatched. |
|---|---|---|---|
| 16th May, 1924 .. .. | 10th April, 1924 .. | Applethorpe .. | 1 |
| 27th May, 1924 .. .. | 17th April, 1924 .. | The Summit .. | 5 |
| 17th May, 1924 .. .. | 11th April, 1924 .. | Dalveen .. .. | 2 |
| 27th May, 1924 .. .. | 10th April, 1924 .. | Applethorpe .. | 5 |
| 31st May, 1924 .. .. | 11th April, 1924 .. | Dalveen .. .. | 12 |

No flies were found to have emerged from any cage placed in the field after 31st May. It is, of course, possible that some fruit flies had emerged and had been destroyed by small ants prior to a visit of inspection.

### Effect of Cold on Adult Fruit Flies.

On 1st April, 150 fruit flies (*C. tryoni*) were placed in two large cages in the Insectary. These cages were stood in large tin trays, containing soil about 3 in. deep. The top of both cages was of wood, and various fruits were suspended in order to

ascertain if the Queensland Fruit Fly would oviposit in captivity. Both sexes were well represented, the female predominating.

Only 14 of these flies died between 1st April and 23rd May, on which latter date 3 deg. Fahr. of frost was recorded, and 12 flies were found dead; on 26th May, 1924, 14 deg. Fahr. of frost was registered and 30 flies died; on 27th May, 1924, 17 deg. Fahr. of frost was registered and 56 flies succumbed; the remaining flies died between 27th May, 1924, and 15th June, 1924.

It seems reasonable to conclude, from the above experiment, that *C. tryoni* cannot, as an adult fly, long withstand the rigorous cold experienced at Stanthorpe during the winter months; but it is, of course, possible that fruit flies seeking very warm and sheltered situations, such as hollow trees or under thick bark, might survive the winter in such situations.

Although the fruit flies in both cages were observed crawling over the suspended fruits oviposition did not take place; nor were any flies seen to mate. Dead female flies examined soon after death showed no egg development.

**Fruit Fly Occurrence on Native Fruit.**

On 12th June, Mr. W. Townsend, of Severnlea, brought to this office several berries picked from a native tree which was growing adjacent to his orchard. One of these berries contained a maggot which, on examination, proved to be that of a *fruit fly. On 16th June a visit was made to Mr. Townsend's property (in company with the Chief Inspector, Mr. T. W. Lowry) to inspect this native fruit.

The tree which was about 15 ft. in height and covered with berries was growing in a very sheltered situation in the bed of a creek, flanked on either side by high hills. No frost could possibly reach the fruit of this tree, as it was surrounded by tall Eucalyptus trees, affording a canopy of leaves above it. The berries were round and black, and not unlike a very small cherry and with a similar stone to this latter fruit. On examining a number of these berries several maggots were discovered (*in situ*), and proved to be those of a fruit fly (*Chætodacus* sp.).

Mr. Lowry, after very careful searching under the tree among the humus and sandy soil discovered many fruit flies puparia.

Specimens of both maggots and puparia, and also of the fruit and foliage of the tree were forwarded at once to the Government Entomologist and Plant Pathologist, Mr. H. Tryon, who concurred with the writer in identifying the maggots and puparia as those of a fruit fly, and Mr. C. T. White, Government Botanist, identified the tree as *Notclæa longifolia*, var. *velutina* from the specimens submitted to him by Mr. Tryon.

This discovery of Mr. Townsend's is of some importance, showing as it does that fruit fly maggots are active in a native fruit in the Stanthorpe district as late as 16th June; also, should these maggots and puparia prove to be those of *C. tryoni* (the Queensland Fruit Fly), *Notclæa longifolia*, will be an additional known native host-fruit of this fly.

The tree *Notelæa longifolia* is of a spreading habit, growing along creek-margins and in very sheltered gullies. Mr. Townsend had, at the time of our visit, located two of these trees, and additional specimens of it were found in the vicinity and also in other parts of the district; and it is probable that many of these trees are growing in sheltered gullies both in the Stanthorpe district and in the adjacent country.

Two fly traps were set in the tree on which maggot-infested fruit was found. One trap was baited with "Magnet Lure," and the other with "Harvey's Lure." These traps were inspected on three consecutive days, but no fruit flies were caught nor were any seen on the tree or in its vicinity. A large quantity of puparia and fruit, and also the soil from under the trees was collected and transferred to the Stanthorpe Insectary. No fruit flies have yet hatched from this material.

**Fruit Fly Puparia under Cultivated Fruit.**

On 8th July, several fruit fly puparia were taken from under maggot-infested fruit (apples) placed nearly two months earlier in the field under a gauze cage. These puparia when lifted from the soil appeared quite normal and healthy, but when examined later in the day in the laboratory they were all found to be dead, and some to contain a creamy liquid in a state of decomposition, and others again were partially dry. The maggots from the above fruit probably pupated towards the middle or end of April, as the fruit was put out on 10th April, and at that time it contained fruit fly maggots in all stages of growth.

* *Lonchea splendida.*

OTHER INJURIOUS INSECTS.

**Leaf Hopper.**

A small "leaf hopper" (*Fulgorid* sp.) was brought to my notice on 12th May by Inspector Maggs. This insect was occurring on quince and apple trees at The Summit. It was only to be found close to the ground on the barrel or trunk of the tree, and was not apparently doing much damage. The trees were surrounded with long grass, and it appeared probable that when this grass was cleared away the leaf hopper would disappear also.

**Orange Bug (?).**

On 12th May, 1924, oranges were received from Inspector F. Williams, of Warwick, showing numerous punctures on the surface; these punctures did not extend into the pulp, and in some cases did not even pierce quite through the skin. None of the punctures contained eggs, and they were probably made by some sucking insect, such as the Green or Black Orange Bug. These punctures were remarkably like those of a fruit fly in appearance, and were in fact supposed (by the owner of the fruit) to have been made by this latter insect.

**Concluding Remarks.**

The weekly inspection of field cages and care of Insectary, &c., has claimed a good deal of time, as has also the preparation of drawings illustrating in colour some of the principal Fruit Flies of the Granite Belt, and the description of same. It is proposed to continue this work in further Bulletins. [The publication of this illustrated Bulletin on Fruit Flies has been officially authorised.—H. Tryon, 21st July, 1924.]

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## HOW TO SLAUGHTER A PIG AND CURE BACON.

The easiest and probably the best method of slaughtering a pig on the farm is to shoot the animal in the head just above the line of eyes, then hang carcass up head downwards, and make an incision in the throat running the knife (a fairly long blade) upwards along the wind pipe until the forked vein is reached; this should be severed in order that the blood may thoroughly drain from the body. The body should then be placed in a vat or round tub sufficiently large enough to scald. The temperature of water used should not be less than 150 degrees Fahr. Scald and scrape the carcass and hang up; next open from the neck upwards to the pelvis, remove the viscera, wash and finally hang to dry in a wholesome atmosphere away from flies.

After hanging over night, the head is separated from the body at the neck behind the ears; the feet and also the internal fat inside the belly are removed. The carcass is next divided into sides in the following manner.

A cut is made the whole length from tail to shoulder on either side of the backbone, which is removed, leaving the ribs intact on the sides; cut hams and shoulders off.

The pig thus cut up is ready for being salted in the following way:—

For every 100 lb. of meat take 3 lb. of coarse salt, 2 lb. of brown sugar, 1 lb. of allspice, 2 oz. saltpetre (well powdered), and 1 oz. carbonate of soda; mix well together. If the other ingredients are not available, salt and sugar in equal parts, with a little saltpetre, will give good results. If possible, rub the meat first with 1 lb. of honey for every 100 lb. of meat. Then rub with about two-thirds of the preparation until it begins to stick well, which is generally in about seven minutes. The first two days' rubbing is the most important, and unless the meat cures then it is not in a suitable condition. After such rubbing, stack the meat in a tank, first putting a thin layer of salt at the bottom; a layer of sides is put on this with the rind downwards, then another layer is crossed on this, and so on until all the bacon has been put in. After twenty-four hours, turn and rub again, adding a little more of the unused mixture, after which turn and rub once in every forty-eight hours, using a little more of the mixture each time. Place the sides which are on the top to-day on the bottom to-morrow, and so on. After twenty-one days in pickle, it is ready for washing, drying, trimming, and smoking.

## SCIENCE NOTES.

### THE ECONOMIC VALUE OF CERTAIN QUEENSLAND PARASITIC INSECTS.

By EDMUND JARVIS, Entomologist, Bureau of Sugar Experiment Stations.

The following notes, which were contributed by the writer to the Pan-Pacific Congress, held in Sydney during August last, proved of special interest to Economic Entomologists.

This matter was included under the general subject-heading of "Commercial Value of Useful Carnivorous Parasites"; and since dealing exclusively with little-known useful insects associated in Queensland with sugar-cane, should, I think, be brought under the notice of our growers.

**(1) *Apanteles Nonagriae* Oliff.**

During the course of breeding experiments conducted by the writer at Meringa Laboratory, 1921 to 1922, it was found that the period occupied by this species from oviposition to emergence of the imagines varied from two to three weeks, under an average shade temperature of about 82 degrees Fahr.

Parasites derived from cocoons collected from bored sticks in canefields at Pyramid, near Gordonvale, were placed during 4th to 6th December in a cage containing a single caterpillar of *Phragmatiphila truncata*, Walk., which had been allowed to crawl behind a leaf-sheath of a healthy ratoon sucker previously planted in the cage. From the one female and five male braconids introduced into the latter, no less than ninety-three parasites issued from this caterpillar on 25th December (twenty-one days later). On the 28th December some of these wasps were put into another cage containing a larva of *truncata*, and only nine days later cocoons of *nonagriæ* were discovered in this cage, from which wasps finally emerged on 12th January, thus giving a period of just a fortnight for the complete life-cycle.

*Apanteles nonagriæ* may, perhaps, parasitise more than one species of Noctuidæ, since it probably continues to produce successive broods during summer months, although its usual host *truncata* is rarely met with here in canefields after December.

Mounted specimens of this tiny parasite were exhibited to entomologists at the Congress.

**(2) *Labia* Sp. (Earwig) (Fig. 3).**

This predaceous insect is exceedingly common in the Cairns district, where it occurs plentifully in canefields, hiding behind leaf-sheaths of standing cane or among the unfolding heart-leaves.

The following data regarding its habits, made by the writer in 1916, are of economic interest:—

When confined separately in large glass tubes with a portion of a cane-leaf infested with plant lice (*Aphis sacchari* Zehnm.), four of these earwigs consumed between them 120 aphides in seven hours.

Upon being introduced into the tubes they pounced without loss of time on their defenceless prey, seizing an aphis with sharp mandibles and holding the succulent morsel aloft whilst engaged in eating it. Each capture was generally followed by a quick backward movement of a few paces, the insect than standing motionless until ready for another mouthfull. It was amusing to observe, with the aid of a powerful reading-glass, how little colonies of aphides scattered in consternation as the enemy walked coolly into their midst and started snapping them up one after another with relentless indifference.

The first victims were often viviparous females, but larvæ, nymphs, and winged imagines were also devoured with equal relish.

One of these earwigs was next allowed to run up the leaf of a large growing cane-plant on which colonies of *Aphis sacchari* had been established and were breeding. About a minute after such release, having travelled 10 or 12 inches, it encountered an assemblage of plant-lice, and at once started to clear them off, eating a dozen or more with scarcely a pause, in a manner that left no room for doubt regarding the nature of one of its favourite foods under natural conditions.

When examined four days later the foliage of this plant was perfectly clean and not an aphis could be found on it.

This species is positively phototropic in a very marked degree towards artificial light, such illuminants as acetylene or benzene being especially attractive.

The imago varies in length form 13 to 16 mm., and is of a general dark reddish-brown colour, with thorax, tegmina, and legs light-yellow, and a conspicuous brown stripe down the centre of wing-covers. The anal cerci of the male are longer and more slender than those of the opposite sex, and much widened at the base internally in the form of an obtuse triangle (*see* Fig. 3 on accompanying plate).

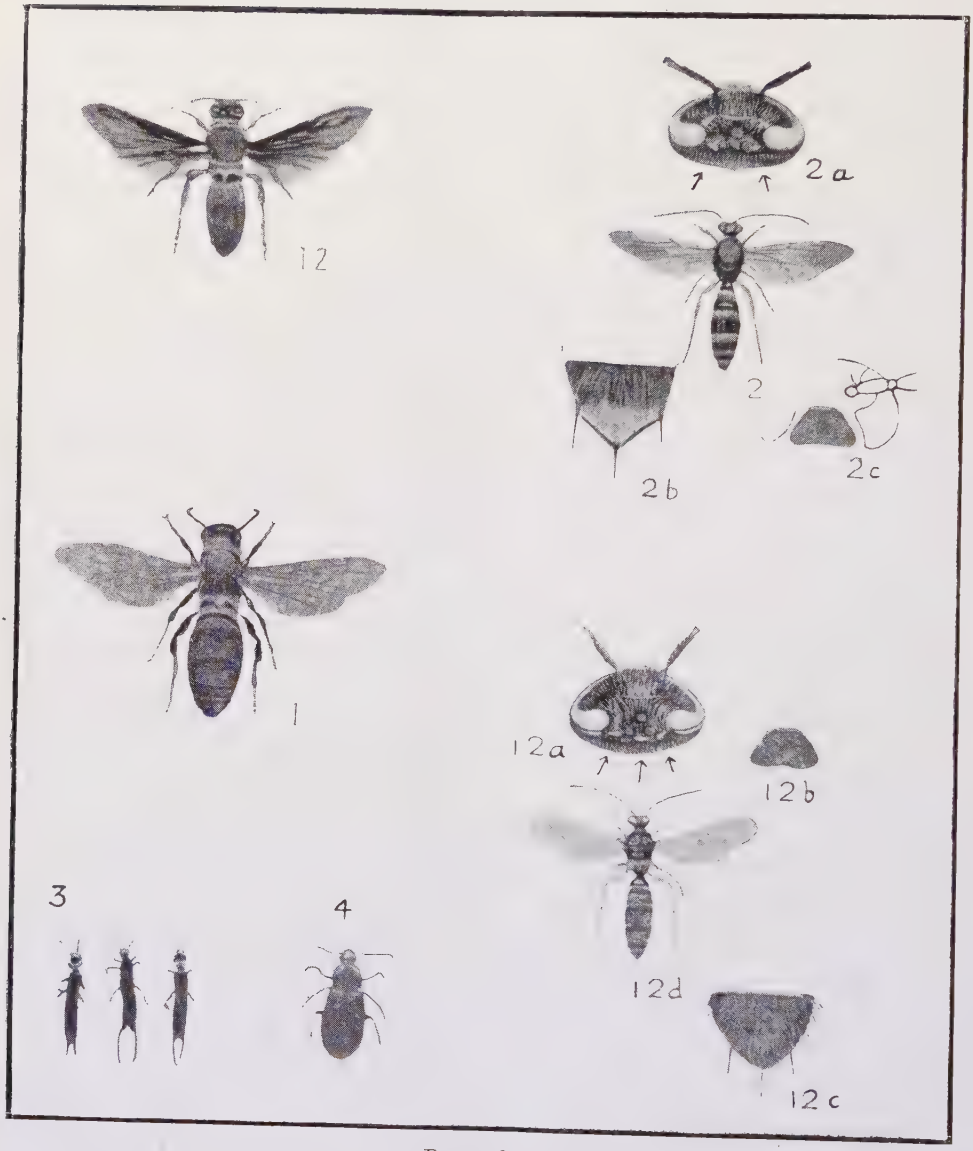


PLATE 38.

Fig. 1. *Campsomeris tasmaniensis* Sauss. Natural size.

Fig. 2. Male of same. Natural size. 2a.—Head, showing two characteristic small yellow spots, × 5. 2b.—Pygidium of same × 9. 2c.—Labrum, with central dark spot.

Fig. 12. *Campsomeris radula* Fabr. 12d.—Male of same. 12a.—Vertex with three yellow spots. 12b.—Labrum, plain. 12c.—Pygidium of same.

Fig. 3. Predaceous Earwigs (*Labia* sp. ?). Natural size.

Fig. 4. *Chalaenius australis* Dej. Natural size.

Living specimens, which had been captured at Meringa during July, were exhibited in Sydney at the Pan-Pacific Conference. About fifty of these earwigs were transported safely in a couple of glass test tubes measuring 7 by 1½ inches, the mouth being plugged with cotton-wool, while provision was also made for indulgence of the thigmotropic habits common to Forficulidæ. These specimens continued alive and healthy in the tubes for two months or longer, requiring little or no attention during that period; so that the introduction of this useful predator into other countries to combat injurious species of Aphidæ could be very easily effected.

### (3) *Chalaenius australis* Dej. (Fig. 4).

Larvæ of this eminently predaceous beetle were observed by the writer during February, 1920, destroying caterpillars of *Laphygma exempta* Walk., which were devouring the leaves of maize and sugar-cane on a plantation at Meringa, near Cairns.

They occurred in the affected area rather commonly, attacking chiefly any caterpillars traversing the ground between cane-stools, but also exploring the foliage in search of larvæ.

Directly one of these predators encountered a caterpillar it instantly buried its keen mandibles deeply in the body near the head, and then simply hung on, while the unfortunate victim vainly endeavoured to shake off its foe, twisted and rapidly rolled over and over convulsively. Such struggles seldom lasted more than a minute, at the end of which time even large caterpillars became too weak to offer further resistance, and suffered the enemy to greedily imbibe their life-juices until its body was swollen and could hold no more.

This larva, which runs with agility, is exceedingly active and pugnacious, residing mostly underground in small holes, sun cracks, or other suitable cover.

Specimens in captivity were fed on noctuid larvæ and pupæ, and soon pupated at the bottom of breeding-cages filled with damp soil.

The pupal condition during March (one of our hottest months) lasted only seven days, the mean temperature at the time being about 87 degrees Fahr.

In general appearance this larva is black, of typical campodeoid form, and slightly exceeds 13 mm. in length (*see* illustration in "Queensland Agricultural Journal," vol. xvi., p. 279).

This useful beetle is 16 mm. long, with prothorax and head shining green above and deeply punctulate; elytra dark-brown edged with green, and often suffused with iridescent pink, each elytron with eight parallel rows of punctures. Ventral surface of body and legs shining black; palpi and basal joints of antennæ reddish-brown (Fig. 4 on plate).

Its transportal into other sugar-growing countries during the imago condition should be a simple matter.

### (4) *Campsomeris tasmaniensis* Sauss. and *C. radula* Fabr. (Figs. 1 to 12d).

During our six warm months of the year (October to March) while the temperature averages about 80 degrees Fahr., the life-cycle of these parasites occupies a period of forty-seven days, three of which are taken up by the egg, and eight by the larval condition, while about thirty-six days represents the intra-cocoon stage.

The table below indicates extreme measurements met with in adult females of both these scoliids, together with the average length and width of second and third-stage grubs of each of the six hosts parastised by them.

Maximum and Minimum Lengths and Widths of Female Digger-Wasps.

| | Minimum. | Maximum. |
|---|---|---|
| *Campsomeris tasmaniensis* Sauss. .. .. | 22 × 5·50 mm. | 30 × 7 mm. |
| *Campsomeris radula* Fabr. .. .. .. | 16 × 6·50 mm. | 27 × 6 mm. |

| Average size of Hosts (natural curved form) .. | 2nd instar. | 3rd instar. |
|---|---|---|
| *Lepidoderma albohirtum* Waterh. .. .. | 22 × 7·50 mm. | 30 × 12 mm. |
| *Lepidiota frenchi* Blackb. .. .. .. | 16 × 6·50 mm. | 25 × 10 mm. |
| *Lepidiota rothei* Blackb. .. .. .. .. | 9 × 4 mm. | 14 × 6·75 mm. |
| *Lepidiota caudata* Blackb. .. .. .. | 21 × 7 mm. | 29 × 11 mm. |
| *Anoplognathus boisduvali* Boisd. .. .. .. | 16 × 5 mm. | 24 × 9 mm. |
| *Dasygnathus australis-dejeani* Macl. .. .. | 12 × 6 mm. | 18 × 10 mm. |

These parasites are to be met with on the wing practically throughout the year, and will oviposit readily on grubs in cages, even during the winter months.

Grubs nearing the end of the second instar appear to be readily victimised by these scoliids. We have records, for instance, of wasps of average size ovipositing on small second-stage grubs of *frenchi;* and conversely of females below average size parasitising big third-stage grubs of *albohirtum.*

Such willingness to oviposit on any host grubs chancing to be available, whether large or small, while naturally enhancing the economic value of these wasps in Queensland, would add greatly to their usefulness in other countries into which they might be introduced as desirable controlling agents against root-eating scarabæid larvæ.

**Number of Eggs Obtained from a Single Female Wasp.**

The following data accumulated by the writer during 1917 to 1919 will be of interest to parasitologists:—

*C. tasmaniensis* (female caught in canefield)—

Laid 65 eggs, produced 26 wasps = 13 male, 13 female.

*C. radula* (female captured in canefield)—

Laid 25 eggs, produced 18 wasps = 8 male, 10 female.

*C. radula* (3 females caught in canefields)—

No. (1)—Laid 23 eggs, produced 17 wasps = 8 male, 9 female.
No. (2)—Laid 34 eggs, produced 5 wasps = 2 male, 3 female.
No. (3)—Laid 49 eggs, produced 11 wasps = 2 male, 9 female.

*C. tasmaniensis* (females bred in office; presumably unfertilised, although a male wasp was placed in same cage)—

No. (1)—Laid 95 eggs, produced 88 cocoons, and 42 wasps; all males.
No. (2)—Laid 62 eggs, 45 cocoons, 34 wasps; all males.

*C. radula* (female bred in office; presumably not fertile, although a male wasp was confined in same cage)—

Laid 69 eggs = 51 cocoons, 32 wasps; all males.

*C. radula* (females bred from eggs laid in office; no male put in cage, but purposely kept unfertilised)—

No. (1)—Laid 19 eggs, produced 6 wasps = 5 male, 1 female.
No. (2)—Laid 19 eggs, produced 4 wasps; all males.

*C. tasmaniensis* (females of second generation bred in office and purposely kept from male wasps)—

No. (1)—Laid 84 eggs = 45 cocoons, 38 wasps, 37 male, 1 female.
No. (2)—Laid 43 eggs = 24 wasps; all males.

*C. radula* (females of second generation bred in office, and kept unfertilised)—

No. (1)—Laid 47 eggs = 38 cocoons, 32 wasps; all males.
No. (2)—Laid 31 eggs = 20 wasps; all males.

*C. radula* (female wasp of third generation bred in office and kept from male)—

Laid 17 eggs = 4 cocoons, 2 wasps; both males.

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## MAIZE FOR PIGS.

Maize is Queensland's best crop for pigs, but maize must be fed in conjunction with other crops or concentrated foods rich in protein and mineral matters, to secure satisfactory results. Pigs fed on maize alone are slow growers, and are unprofitable. The pig raiser is advised to grow crops such as lucerne, sorghums, rape, and skinless barley, wheat, oats, sugar-cane, arrowroot, peanuts, sweet potatoes, mangels, sugar beets, artichokes, chow moellier and kale, pumpkins and melons, panicum, millets, and grasses, and provide abundant succulent pasture. These foods combined with maize and dairy by-products, skim milk, butter milk, and whey provide the bulk of the pig's requirements. The Queensland climate is favourable to the growth of all the crops required for successful pig farming, but it is necessary that the foods should be properly balanced and fed to the greatest advantage.

## MOUNT GRAVATT EGG-LAYING COMPETITION.

The following are the scores for the month of June, the average per bird being 15·6 eggs :—

### SECTION 1.

LIGHT BREEDS.

| Name. | Breed. | A. | B. | C. | D. | E. | F. | Month | Total. |
|---|---|---|---|---|---|---|---|---|---|
| W. and G. W. Hindes | White Leghorns | 61 | 62 | 49 | 55 | 58 | 55 | 125 | 340 |
| H. T. Britten | Do. | 49 | 62 | 55 | 48 | 57 | 38 | 119 | 309 |
| Kidd Bros. | Do. | 62 | 58 | 26 | 57 | 49 | 51 | 94 | 303 |
| W. H. Flowers | Do. | 40 | 38 | 57 | 42 | 63 | 61 | 111 | 301 |
| Oakleigh Poultry Farm | Do. | 45 | 59 | 47 | 37 | 56 | 56 | 109 | 300 |
| John T. McLachlan | Do. | 61 | 60 | 56 | 32 | 34 | 21* | 99 | 293 |
| Arch. A. Stirling | Anconas | 48 | 55 | 59 | 47 | 36 | 45 | 91 | 290 |
| W. D. Melrose | White Leghorns | 29* | 56 | 61 | 46 | 63 | 15 | 111 | 289 |
| T. W. Honeywill | Do. | 51 | 63 | 45 | 39 | 54 | 29 | 100 | 281 |
| S. Grenier | Do. | 23* | 41 | 49 | 43 | 53 | 52 | 108 | 273 |
| J. E. G. Purnell | Do. | 50 | 34 | 41 | 48 | 47 | 52 | 112 | 272 |
| Mrs. R. E. Hodge | Do. | 60 | 52 | 33 | 57 | 38 | 29 | 112 | 269 |
| G. W. Cox | Do. | 45 | 30 | 55 | 29 | 63 | 45 | 69 | 267 |
| H. Fraser | Do. | 54 | 48 | 36 | 58 | 28 | 40 | 88 | 264 |
| W. Wakefield | Do. | 1 | 51 | 46 | 45 | 56 | 60 | 78 | 259 |
| Mrs. L. Anderson | Do. | 52 | 35 | 39 | 27 | 51 | 50 | 120 | 254 |
| R. C. J. Turner | Do. | 55 | 52 | 20 | 41 | 15 | 62 | 87 | 245 |
| L. Bird | Do. | 59 | 52 | 44 | 3 | 45 | 39 | 108 | 242 |
| Chris. A. Goos | Do. | 3 | 52 | 45 | 62 | 32 | 37 | 73 | 231 |
| Arch. Neil | Do. | 50 | 49 | 29 | 48 | 20 | 32 | 103 | 228 |
| T. H. Craig | Do. | 46 | 33 | 32 | 42 | 17 | 56 | 89 | 226 |
| L. J. Silman | Do. | 51 | 47 | 43 | 26 | 31 | 24 | 79 | 222 |
| T. W. Biddulph | Do. | 58 | 51 | 3 | 35 | 25 | 46 | 68 | 218 |
| J. W. Newton | Do. | 44 | 28 | 24 | 26 | 45 | 30 | 86 | 197 |
| G. Marks | Do. | 60 | 29 | 25 | 21 | 27 | 31 | 97 | 193 |
| H. P. Clarke | Do. | 24 | 28 | 34 | 39 | 40 | 24 | 96 | 189 |
| W. McHardie | Anconas | 38 | 27 | 18 | 35 | 28 | 35 | 62 | 182 |
| Ancona Club, Pen 1 | White Leghorns | 24 | 20 | 38 | 43 | 34 | 1 | 83 | 160 |
| Geo. Williams | Do. | 36 | 38 | 18 | 22 | 29 | 16 | 64 | 159 |
| B. Driver | Do. | 22 | 9 | 11 | 61 | 33 | 20 | 55 | 156 |
| Ancona Club, Pen 2 | Do. | 32 | 27 | 9 | 23 | 28 | 17 | 56 | 136 |

### SECTION 2.

HEAVY BREEDS.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| James Potter | Black Orpingtons | 61 | 69 | 59 | 61 | 58 | 33 | 115 | 341 |
| James Hutton | Do. | 47 | 70 | 62 | 45 | 63 | 54 | 125 | 341 |
| H. M. Chaille | Do. | 42 | 51 | 55 | 45 | 64 | 26 | 106 | 284 |
| Kidd Bros. | Do. | 47 | 18 | 48 | 46 | 61 | 48 | 96 | 268 |
| Carinya Poultry Farm | Do. | 43 | 28 | 57 | 43 | 41 | 54 | 123 | 266 |
| W. and G. W. Hindes | Do. | 25 | 51 | 34 | 46 | 66 | 29 | 134 | 251 |
| F. W. Lenny | Do. | 52 | 22 | 60 | 31 | 23 | 38 | 114 | 226 |
| E. Walters | Do. | 5 | 5 | 24 | 66 | 66 | 58 | 87 | 224 |
| R. Burns | Do. | 46 | 34 | 40 | 36 | 27 | 26 | 121 | 207 |
| Mrs. A. E. Gallagher | Do. | 26 | 51 | 31 | 28 | 25 | 26 | 108 | 187 |
| Mrs. A. Kent | Do. | 34 | 53 | 15 | 35 | 11 | 39 | 58 | 187 |
| J. Ferguson | Do. | 1 | 34 | 36 | 33 | 19 | 10 | 70 | 133 |
| H. G. Stevens | Do. | 11 | 28 | 1 | 34 | 1 | 33 | 59 | 108 |
| E. C. Stead | Wyandottes | .. | 33 | .. | 2 | .. | 20 | 45 | 55 |

* Replaced bird.

P. RUMBALL, Supervisor.

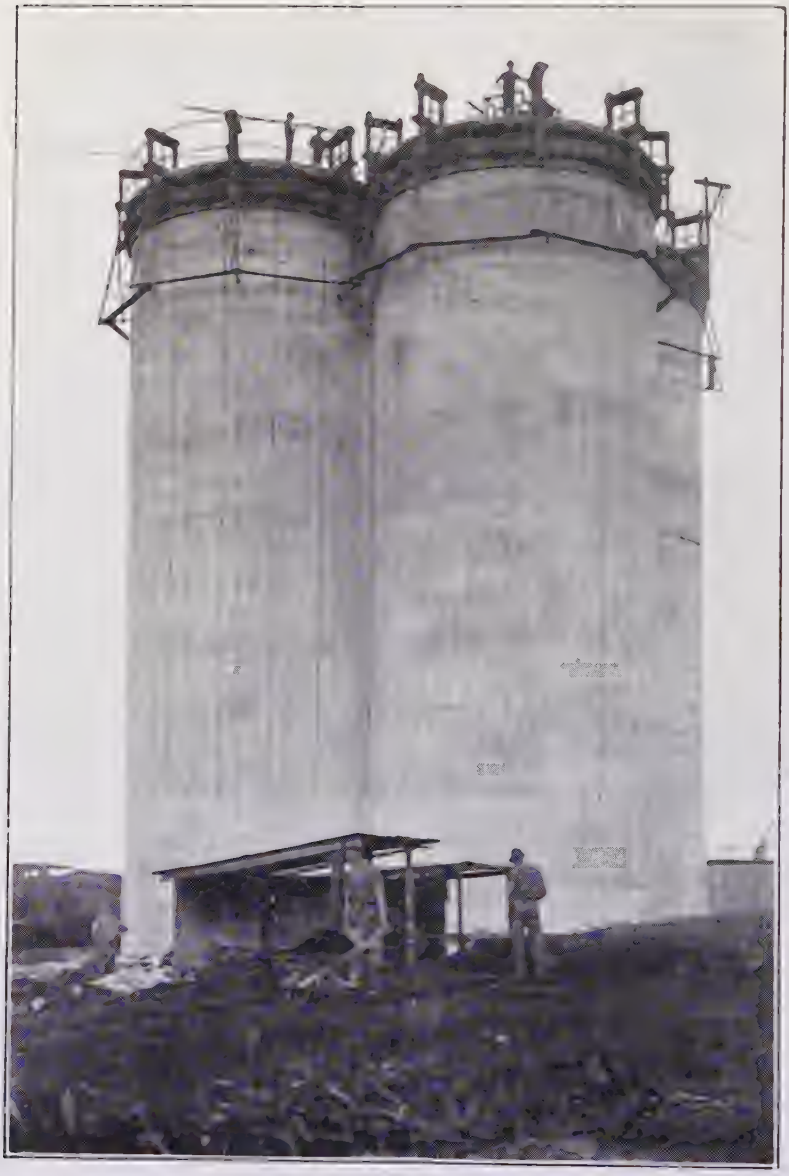

PLATE 39.—MAIZE SILO AT TOLGA, ATHERTON TABLELAND, NEARING COMPLETION.

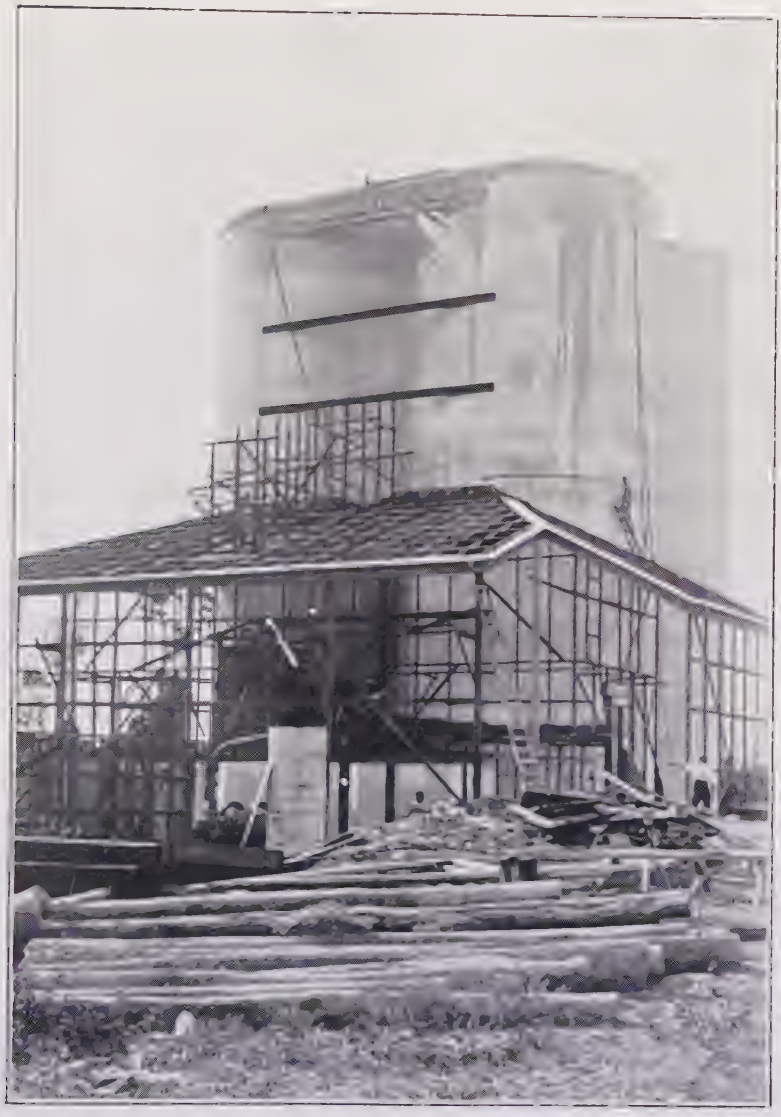

Plate 40.—Maize Silo at Atherton, nearing Completion.

To be controlled by the Atherton Maize Pool Board. In the foreground is the framework of the receiving and drying shed.

*Photo. Arthur Jones.*]

PLATE 41.—AN ATHERTON VIEW.

Showing Grain Silos erected recently for the Atherton Tableland Maize Board.

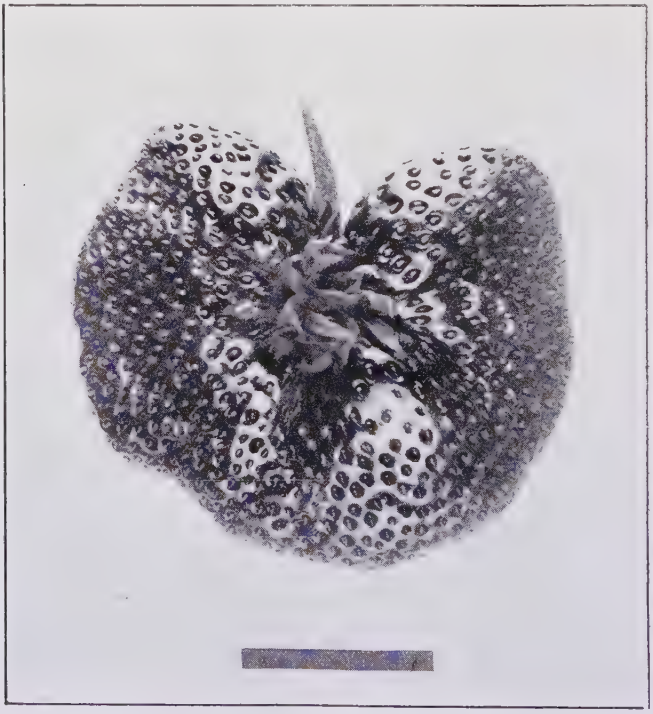

PLATE 42.—A SAMPLE OF A FINE BIRKDALE STRAWBERRY CROP.

Grown without irrigation in fertilised soil by H. Sturman. Weight, 1½ oz. Some of the berries in the same crop weighed up to 2 oz.

## MEAT INSPECTION AND PUBLIC ABATTOIRS.

In the course of a recent Press statement the Minister for Agriculture and Stock (Hon. W. N. Gillies) said: That Brisbane is behind the times in its method of slaughtering stock for human consumption no one with any knowledge of the subject will deny, and public abattoirs for this most populous part of the State are, in his opinion, long overdue. All the same, he denied the inferential charge that the conditions existing with regard to the handling of meat and the inspections of same are worse than they were. In fact, he claimed, and it will be admitted by those who have taken an interest in the matter, that both the condition of the premises and the inspections have improved very much since he took over the Department five years ago. There were then thirty-eight slaughter yards in the metropolitan and suburban areas; now there are forty-one, and practically all those premises which did not comply with the Act have been either rebuilt or improved in accordance with the fifth schedule of the Act.

Three new Inspectors have been appointed, and in addition two of the Veterinary Officers have been deputed to make periodical visits of inspection to all the premises, and, further, four officers are detailed for duty at the bacon factories where the inspections are continuous.

The provision of the minimum-sized slaughter-house, built on up-to-date principles, with concrete floor, proper drainage facilities, and an adequate water supply for cleansing purposes, is now insisted upon.

It has been stated in the Press that a leading medical authority referred to Fluke and Trichina as being dangerous to human beings. He was correct in saying that there is at least considerable doubt in the minds of authorities regarding Fluke, and also as to the existence of Trichina in this State at all. The condemnations on account of tuberculosis are very light, and the latest returns show the following percentages of the total number of carcasses inspected:—Cattle, ·2109 per cent.; calves, ·005 per cent.; pigs, ·570 per cent.; sheep and lambs, nil.

It is true that Brisbane is the only capital city without public abattoirs; but, all the same, on the latest figures the death rate of our city is the lowest but one in the Commonwealth.

### Abattoirs Recommended.

With the establishment of public abattoirs the inspection of meat can not only be cheapened but it can be made perfect, continued Mr. Gillies, and on their establishment alone can the public be guaranteed that its meat supply is absolutely pure.

The Queensland Labour platform provides for municipal ownership of abattoirs, and the Greater Brisbane Bill will make provision for same. The municipal form of control operates in all the Australian abattoirs, with the exception of Homebush and Kalgoorlie, which are State controlled, the former by a Board appointed under the Minister for Health.

Adelaide and Newcastle are, it is believed, amongst the more successful of municipal undertakings in the Southern Hemisphere. The Adelaide establishment (which cost over £350,000 to build and equip) like Newcastle, is managed by a Board consisting of representatives of the various Local Authorities within the sphere of its operations. The Adelaide scheme provides for the holding of stock sales two days per week in the adjoining saleyards, at which butchers purchase the live stock required by them. Such stock, if required for immediate consumption, is handed over in accordance with proper regulations to the superintendent for slaughter; if not required immediately, they are despatched to paddocks adjoining until further notification.

All slaughtering, chilling, and delivery of meat is done by the abattoirs authorities at fixed charges, which are accepted as reasonable. Until handed over for slaughter all stock remains in the hands of the salesmen or purchasers, who are alone responsible for losses, though the abattoirs authorities will paddock same at a fixed charge per head per day. All hides, skins, and edible offal remain the property of the butchers. Fat and some other portions are purchased by the abattoirs. Blood and unedible offal is the property of the abattoirs and is allowed for by average in the charges made for treatment. In carrying out this system very little difficulty is now experienced. The organisation and supervision are said to be so perfect that it is quite a rare occurrence for any claim to be made by butchers for mistakes in delivery.

Mr. Gillies mentioned that suggestions had been put forward from time to time that one of the existing meatworks might be utilised, and that a combination of abattoirs and meatworks was worthy of consideration.

In the establishment of abattoirs, in his opinion, every other consideration should be subordinated to that of public health. The Wolston site of 2,600 acres, set apart by the present Government, has much to commend it. It has, perhaps, all the advantages of every other site, with the exception of water frontage for shipping facilities. There is plenty of room, it is convenient to rail and road, and not too far from the city.

Following the recommendation of the Royal Commission on the Meat Industry in 1913, the Department of Agriculture and Stock gave consideration to the establishment of abattoirs, the estimated cost of which, at that time, was £150,000. The scheme provided, in addition to the metropolitan area, for such places as Ipswich, Goodna, Corinda, Rocklea, Wynnum, Manly, Cleveland, Sandgate, and Zillmere, and possibly Strathpine, Petrie, Caboolture, Beenleigh, and Southport.

The latest figures go to show that in the metropolitan area approximately 60,000 head of cattle, 32,000 head of sheep, 25,000 calves, and 15,000 pigs are slaughtered per annum. In addition to the establishment of abattoirs, of course, a central depôt in the city, with sub-depôts at other convenient points, would be needed where the chilled carcasses, &c., would be delivered by train, whence delivery by cart or lorry to the shops would take place under proper supervision.

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PLATE 43.—THE "EMPIRE CHALLENGE CUP."

(Value Twenty Guineas).

The cover is surmounted by the globe of Dominion, supported on the heads of four Berkshire Pigs. The Cups are executed in hand-beaten and wrought silver and with the oak base are 17 in. high.

The Society awards Empire Challenge Cups to the Champion Berkshire Pigs at the principal Shows in the Dominions, 2 in Canada, 2 in South Africa, and 2 in Australasia.

The subject of securing a Cup for competition among Queensland Breeders will be discussed at the Annual Meeting of the Queensland Board of the Berkshire and Yorkshire Society on Wednesday, 13th August, at Affleck House at the Show Grounds, Brisbane.

*Photo. H. Mann.*]

Plate 44.—A Fine Coulston Lake Maize Crop, Grown by Henry Mann and Sons on their Delamere Property.

The Seed, improved Yellow Dent, was obtained from the Department of Agriculture. The stalks attained a height of 14 feet and carried cobs of uniform size and true to type.

*Photo. Randolph Bedford.*]

PLATE 45.—THE HEALTHY WEST—A YOUNG QUEENSLAND FAMILY AT MOUNT MARGARET, SOUTH OF EROMANGA.

## FORTHCOMING SHOWS.

Royal National: 11th to 16th August.
Gympie: 20th and 21st August.
Herbert River-Ingham: 22nd and 23rd August.
Belmont: 23rd August.
Imbil: 27th and 28th August.
Coorparoo: 30th August.
Crow's Nest: 4th September.
Wynnum: 6th September.
Pomona: 10th and 11th September.
Esk Bushman's Carnival: 10th and 11th September.
Beenleigh: 11th and 12th September.
Zillmere, 13th September.
Narangba: 20th September.
Melbourne Royal: 18th to 27th September.
Stephens: 20th September.
Rocklea: 27th September.
Kenilworth: 2nd October.
Toombul: 3rd and 4th October.
Southport: 10th October.

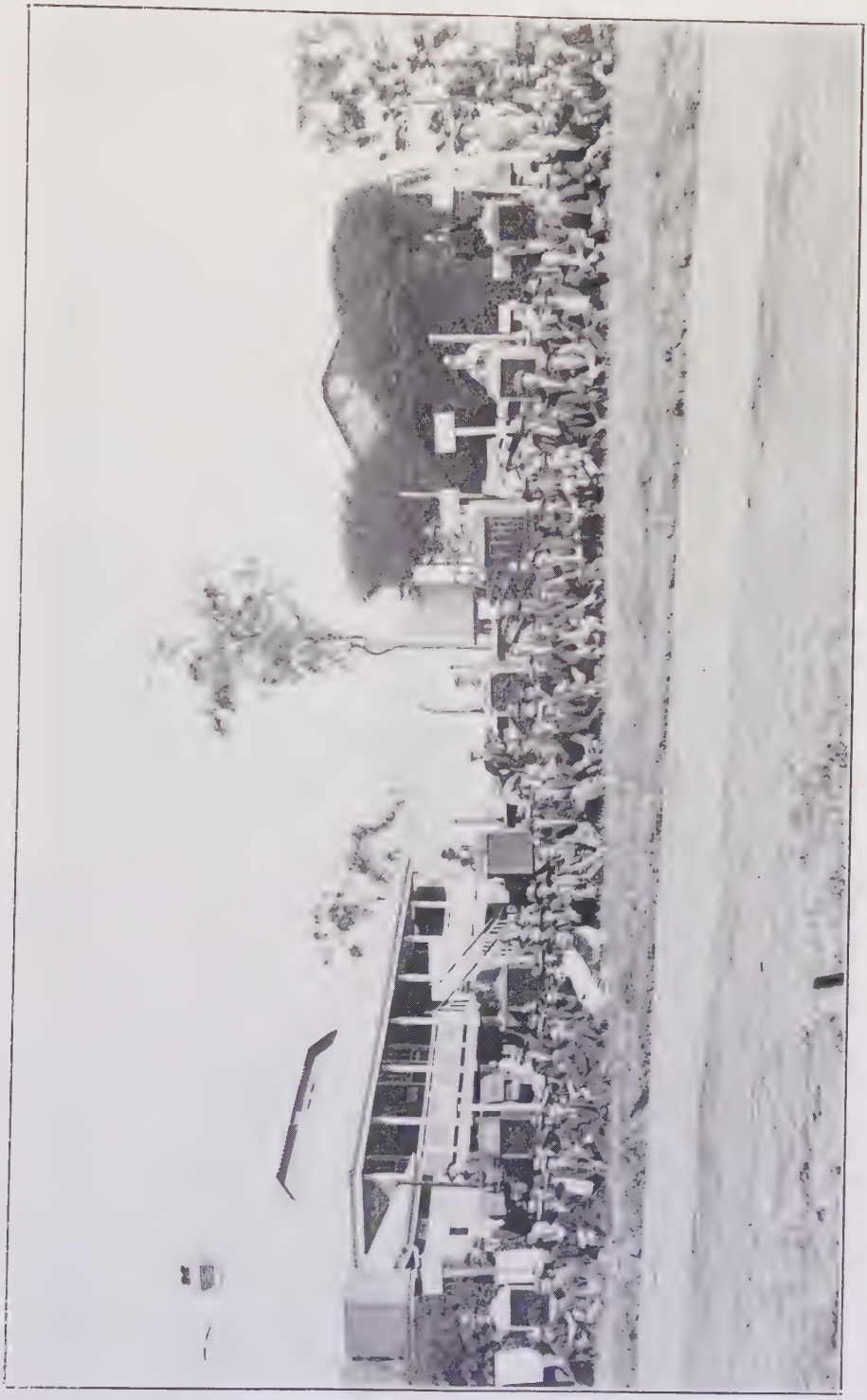

PLATE 46. THE TRACTOR SCHOOL AT GATTON—AN INTERESTING GROUP.

# General Notes.

### Maize in Second-hand Potato Bags—A Southern Prohibition.

The New South Wales Department of Agriculture has drawn the attention of the Queensland Department to the fact that a large quantity of maize is being forwarded from this State to New South Wales in second-hand potato bags.

Used potato bags may be a medium for the conveyance of spores of many potato diseases, and the regulations of New South Wales are levelled against the use of second-hand containers.

All producers or agents, therefore, who are forwarding maize in second-hand potato bags, are warned that the entrance of such bags into New South Wales is prohibited, and that, if they continue to forward such bags filled with maize or any other product, such maize or product will not be permitted entry into that State.

### Cheese Consumption.

Interest has been aroused in the campaign launched recently by cheese distributers in Melbourne with a view to stimulating the home consumption of cheese. Cheese manufacturers gave this subject their attention towards the end of last March, when stocks of the commodity had so accumulated as to cause grave concern, and the advisability of export as a means of relieving the situation was then discussed.

Figures submitted in regard to future prospects indicated that during April, May, June, and July, the production of cheese would be 50 per cent. greater than for the corresponding period of last year. Supplies received in Melbourne from 1st April to date are, however, greater than the figures of last year to the extent of 100 per cent. Those connected with the industry are not only concerned with the accumulation of stocks, but they consider that the difficulties at present existing are bound to recur. To ship the surplus to overseas markets may show a loss on rates prevailing locally of quite 3d. a lb. This loss actually occurred on a shipment which manufacturers agreed to make in March in order to relieve the position. It is pointed out that a large number of returned soldiers are suppliers to factories which produce cheese, and that a slump in the market will seriously affect these soldier settlers, as well as producers generally. The March shipment to Great Britain realised only about 6¼d. a lb. to the factories, a price which was very unprofitable as compared with 9d. and 10d. a lb. for the cheese sold locally.

Cheese distributers agree that the campaign should be entered into thoroughly. It is recognised that it will probably be an expensive undertaking, and they consider that the expense should be borne not only by them, but also by those who are vitally concerned—the manufacturers. They also agree that the campaign should not stop with the present effort—that the desirability of eating more cheese should be brought before the public periodically until a stage has been reached when the supply and demand will much more nearly coincide, so far as local consumption is concerned. In view of the food value of cheese, and the fact that the substitution of cheese in more liberal quantities for other articles of diet will not increase the household bill, the promoters consider that they have a strong case to put before the public.

It is estimated that the energy supplied to the system by the consumption of 1 lb. of cheese is the equivalent to the energy supplied by 1.98 lb. of sirloin steak, 2.61 lb. of round, 2.52 lb. of fowl, 1.17 lb. of smoked ham, and 1.29 lb. of fresh ham. Taken over an average of five years, Australia consumed 3.47 lb. of cheese a head of population a year against 26.4 lb. in Switzerland, 13.3 lb. in the Netherlands 12.3 lb. in Denmark, 11.2 lb. in Great Britain, 9.5 lb. in Germany, 8.1 lb. in France, and 7.1 lb. in Norway.

A leading doctor who was consulted concerning the campaign to encourage the more general use of cheese as an article of diet, said that cheese contained protein—the nitrogenous element in food. It was the element in milk that was used for building up the body. It contained a certain amount of fat incorporated with it in the making. Contrary to the generally-conceived notion, if properly masticated cheese was fairly digestible. It could with advantage be used in moderate quantities daily. There were two matters which might well be taken into consideration in a campaign of this nature. To encourage a more general use of cheese as an article of diet—and it would be to the advantage of everyone to consume a great deal more cheese than at present—attention might be given to making the local product as

palatable as possible. New Zealand Stilton cheese, for example, had a vogue everywhere, and Victorian manufacturers might follow New Zealand's example in this respect. The question of price might also be considered, as the more reasonable the price the greater would be the prospect of success in the propaganda work about to be undertaken.

### Need for a Forest Sense.

Forestry problems were discussed in an address given at a Rotary Club gathering in Melbourne recently by the chairman of the Forestry Commission (Mr. Owen Jones). The chairman of the Victorian branch of the Forest League (Professor W. Osborne) was the chairman for the day, and, in introducing the speaker, he referred to the fourth annual report of the Forestry Commission, which, he said, provided a scathing indictment on the ways of exponents of public policy. The recommendations of the Commission had been disregarded year after year, while every expert agreed upon the nearness of the soft wood shortage. Land that should have been reserved for forests had been opened for settlement against the advice of the Commission. The settler, after giving it a fair trial, had generally retired broken-hearted, and the once valuable land had geen given over to bracken fern and rabbits.

### Forestry not a Fashionable Fad.

Continuing the lecturer said that forestry was no mere fashionable fad, but it was a vital question. From the cradle to the coffin we depended on wood, and we could not live without it. The two main functions of forestry were its valuable material and its influence on climatic conditions. Everything that was produced came to market in wooden containers, on wooden drays, along wooden sleepers on the railways. Another important function was news. Telephone and telegraph messages required wooden poles, and newspapers required wood pulp for the manufacture of paper. In the United States of America alone the amount of wood used for wood pulp amounted to 15,000,000 tons a year. Sport and entertainment also depended upon wood, and many products came from the forests. It was obvious that to obtain those benefits the forests must be preserved.

### The World's Soft Wood Supply.

At the Empire Forestry Conference, at which he represented Victoria last year, continued Mr. Jones, the question of the world's soft wood supply was considered. It was ascertained that a serious position existed, as only three European countries produced more timber than they used. In Canada the total consumption was 900,000,000, cubic feet a year. The ravages of fire, pests, &c., increased it by 4,000,000,000 cubic feet a year. At that rate the supply would become exhausted in twenty-five years, and the home utilisation was increasing yearly. In the United States of America the area had been reduced from 822,000,000 acres of forest to 463,000,000 acres, and it was being cut out at the rate of 5,500,000 acres a year. There were 26,000,000,000 cubic feet used every year—four times more than the estimated growth.

### Australia should be Self-supporting.

It was absolutely essential, Mr. Jones stressed, that Australia should be self-supporting, as it was certain we could not depend upon other countries indefinitely for our needs. Of all the great countries in the world Great Britain had, possibly, shown the greatest apathy in regard to timber. The position was intensified in Australia owing to the conditions prevalent in a new country. There was a growing agreement that our forests must be protected, waste eliminated, and future supplies arranged for. It was only an abstract idea, however. Many people failed to realise the necessity for immediate action, others failed to see the need for forestry, while others considered that a measure of protection was all that was necessary. Forestry was a business of vital national importance; numberless industries depended upon it, and it required the application of business principles. It was also a profitable business. In India the average net income from forest lands amounted to £1,000,000 a year.

It has been freely stated that the locking up of land diminished employment and would reduce the population. Some years ago 1,200 acres of land at Warburton were offered for sale at 15s. an acre, payable in twenty years. The land carried valuable timber, and, fortunately, was withheld from settlement. A sawmill was opened there, and in ten years it cut 27,000,000 super. feet of timber, worth £250,000. The royalty of 1s. 3d. a 100 super. feet to the Ministry amounted to £17,000. The mill was still working, and the State still owned the land. Under agriculture it would have supported four men, while the mill employees numbered twenty.

### Looking Ahead.

Concluding, the lecturer emphasised that forestry was a question of even greater importance to the rising generation. Timber supplies would be sufficient for the present generation, but we held the forests in trust, and could not squander the forest capital. As we received it as a free gift, so must we hand it on unimpaired. Forestry should appeal to Rotarians. Forestry, like rotary, had as its basic idea service to the community. There was a long time between seed time and harvest, and the individual forester rarely saw the result of his labour. He was worthy of all the sympathy that could be given him.

### Equine Ophthalmia.

Of ophthalmia there are two forms, *i.e.*, simple ophthalmia, caused by direct irritation, or possibly by catarrhal affection; periodic ophthalmia is a constitutional disease, appears periodically without apparent cause, and after a few attacks results in blindness from cataract. Treatment in either case consists in administering a laxative, as 1½ pints of raw linseed oil. Keep the horse in a comfortable stall excluded from draughts and direct sunlight. Get a lotion made of 10 grains sulphate of zinc, 20 drops fluid extract of belladonna, and 2 ounces of distilled water. Bathe the eyes well three time daily with hot water, and, after bathing, put a few drops of the lotion into each eye. Recovery may be slow, so have patience and continue the treatment for some time if necessary.—"The Queenslander."

### Wheat Crop Prospects.

Discussing the prospects of the coming season's wheat crop, Mr. W. Binns (manager of the State Wheat Board) said recently that, as a result of the general winter rains the prospects were now good all over the wheat belt. Generally, they had been considerably improved, and although the rain would not assure a harvest, yet it would give a wonderful start to the wheat crops, which, if they got refreshers and a good downpour in September, would assure a good harvest. In the wheat area from Toowoomba to Maranoa, out to Goondiwindi and Killarney, the rain had resulted in a general increased demand for seed. He pointed out that it was not too late to sow what are recognised as middle season's wheats, such as Amby, Coronation, Warren, and Gluyas, and, of course, the planting of Florence can be carried out right up to the end of August. The prospects were really bright, and with the opoprtunity now afforded for further areas to be planted, prospects pointed to a harvest equal to the two years of 1920 and 1921, when the yields were 4,000,000 and 3,000,000 bushels respectively. The Board holds no stocks, except seed reserves, and, therefore, is in a position to commence operations immediately the harvesting starts.

### Stretching Wool.

Mr. H. J. W. Bliss, the Director of the British Research Association of the Woollen and Worsted Industry, has announced an interesting development in connection with the spinning of wool. From tests made at the Bradford Technical College it is claimed that 20 per cent. finer counts can be obtained from a given quality of wool by stretching the fibres when wet instead of when dry. Thus, in ordinary testing, if certain lengths of woollen fibre are stretched 10 or 15 per cent. in a dry condition, the same fibres will not break when wet if extended 30 per cent. In some cases the stretching has been increased to 50 per cent. without breaking point being reached.

Working upon Mr. Bliss's idea, the Research Association devised machinery to spin wool to a finer count than would be possible with the use of the present dry process. So far, the experiments have been on a demonstration scale, but they have been carried far enough to show that the plan is worthy of careful investigation. The use of hot steam, water, and other chemical agents in connection with lower quality wool is to be tested on a commercial scale. There are many practical difficulties to be solved, but the savings promised by the method are large, in view of the great difference in value between 56's or 58's crossbreds and 64's and 70's merinoes. The suggestion of Mr. Bliss is that the cheaper crossbred wool can be made by this method to spin as fine a count as the expensive merino. To-day, an average 64's merino top is valued at 6s., whereas 56's are worth only about 4s., a difference of 2s. a pound. It has, however, to be shown that the fine crossbred wool can not only be spun in this fashion, but that it will produce cloth of equal quality. There may be an appearance of harshness in the fabric produced from the crossbred wools, and if this is so the saving may not be worth while. So much interest has been aroused by Mr. Bliss's announcement, and the prospects of profit are so great, that the scheme is certain to be tested fully during the next few months.—"Australasian."

### A Desirable Beef Type.

Armour's, the American packing company, in their booklet, "Progressive Beef Raising," define the type of steer they like best as follows:—The animal as viewed from the side should be straight in top and underline, deep, low-set, stylish in carriage, symmetrical in all parts, and possessed of a smooth, thick, meaty appearance. From the rear he should be wide throughout and even, smooth through the shoulders, hook points and rump, and deep and thick in thigh, lower round, and twist. From the front he should show a pronounced breadth from shoulder top down through the breast, his neck and shoulder vein should be plump with fat, his head short, broad, and well dished, and his legs set well apart. Such a steer will carry thick cuts in the valuable parts, and be proportionate between his carcase and the internal organs that provide his meat-making machinery. He should be thick, smooth, and mellow to the touch in all parts of his body, and as refined in bone, skin, and hair as possible without reducing his ruggedness or vigour.

The fat cattle buyer not only determines what kind of carcase the animal he buys will produce, but he also determines what the steer will yield, in terms of carcase to live weight. This is known as the dressing percentage, and depends on the condition, the freedom from punchiness, the type, and the quality. Fat steers always outdress animals of less finish, the degree of their condition being judged in accurate detail by the filling of the tongue root, brisket, shoulder vein, flank, and twist, in addition to the general covering over the body. The fill of the digestive organs with feed and water is as important as the condition. In shipping, steers of 1,200 lb. weight frequently shrink 40 to 60 lb., due to the emptying of the digestive tract, which is 3 to 5 per cent. of the entire weight of the animal.

### Butter Exports for May—Queensland Leads.

During May, 468,832 lb. of butter was exported from the Commonwealth. New South Wales supplied 15,344 lb., Victoria 72,072 lb., Queensland 344,680 lb., and South Australia 36,736 lb.

### Refrigerating Experiments.

Some very interesting experiments on the freezing of beef are being carried out at the Melbourne cool stores under the supervision of the Institute of Science and Industry, and the Departments of Physiology and bio-Chemistry, at the Melbourne University. It has been noticed that, while the Australian mutton which arrives in England is in good condition, the beef is damp and does not look at all attractive. The tests are being carried out in the hope that some remedy for this will be obtained, thereby enabling Australian beef to compete with the Argentine product. Mr. J. R. Vicary, a graduate in science of the Melbourne University, is supervising the tests.

### America as a Market for Australian Meat.

It was stated at a Scottish cattle-breeding conference, at Edinburgh on 12th July, that the United States was reaching its limit of production in beef and mutton. The British Dominions would soon find a market there. Major Wentworth, of Chicago, thought that, within the next fifteen years, it would be possible for Australasian lamb, and, possibly, beef, to enter America, but the market would not be obtained without a struggle.

### Receipt of Annual Seed Cotton—Time Extended.

The time limit fixed for the receipt at ginneries of annual seed cotton and for payment of the advance has been extended by one month—from 31st July to 31st August.

The Minister for Agriculture and Stock (Mr. Gillies) said recently that owing to the lateness of the harvest of annual seed cotton, brought about by the abnormally dry season, he had decided that annual seed cotton would be received at the ginnery until 31st August next, and that the advances for annual seed cotton received during August would be made at the same rates as if it had been delivered before 31st July, the prescribed date for closing the cotton year.

Mr. Gillies also stated that he had received notification from the Director of Agriculture, in Melbourne, to the effect that Victoria had prohibited the introduction into that State from the States of Western Australia and Queensland and from the Northern Territory of all ginned or unginned cotton and of cotton seed, unless accompanied by a certificate from the Agricultural Department of the exporting State or Territory that such cotton or seed had been treated so as to destroy any hibernating larvæ of the pink boll worm.

### Cotton for the Continent.

The first consignment of cotton to be forwarded direct from Queensland to the Continent of Europe was taken by the Holland-Australia steamer Arendskerk, which left recently for Genoa, Dunkirk, Antwerp, Hamburg, Bremen, and Rotterdam. It consists of ten bales. The vessel also loaded 2,000 bales of wool at this port.

### The Winter Pineapple Crop.

The picking of the winter crop of pines has commenced on the North Coast, and the first truckloads have been marketed. Vegetable growers are reaping the benefit of a splendid season and good markets. The sugar expert inspected crops at Glass House Mountains, and was surprised to see crops of from 20 to 25 tons standing on land that had previously grown pineapples for seven years without a spell.

### The Queensland Producers' Association.

The Petty Sessions District of Cape River has been included in District No. 2, as constituted in accordance with the Primary Producers' Organisation Acts, and the Petty Sessions District of Emerald, and that portion of the Petty Sessions District of Clermont situated to the east of the Suttor River and Mistake Creek have been included in District No. 4.

### Government Clydesdale Stallions.

Applications will be received by the Under Secretary, Department of Agriculture and Stock, Brisbane, until 12th August, 1924, from owners of Clydesdale mares, in the undermentioned districts, who desire the services of a Government Clydesdale stallion during the coming season. Applicants are to state age, breeding, colour, and description. The mares entered will be examined, and if approved of, an agreement will be entered into with the owners with respect to the service. The date of such examination will be duly notified to owners. Fees for service will be two guineas (£2 2s.), and fees must be paid at or before the time of the first service. Beaudesert, Bundaberg, Beenleigh, Chinchilla, Isis, Crow's Nest, Caboolture, Maroochy, Dalby, Esk, Gayndah, Cinnabar, Wooloogá, Gatton, Killarney, Laidley, Maryborough, Nambour, Oakey, Noosa, Pittsworth, Central Queensland, Toowoomba, Toogoolawah, and Warwick.

### An Interesting Milk Record.

The time it may take a cow to mature and show her quality as a milker is strikingly emphasised in a record published in a recent issue of the "Journal of the Ministry of Agriculture," London. The animal (a non-pedigree Shorthorn) has been retained by her owner, contrary to his usual practice of selling cows when carrying their third or fourth calf, in order to test a remark which he had heard concerning the cow's sire, to the effect that the longer the progeny of this bull were kept the better milkers they would be.

The following annual and lactation yields confirm the accuracy of this remark:—

| | Days in Milk. | Milk Yield (lb.). |
|---|---|---|
| Year ended 1st October, 1918 .. .. .. .. | 274 .. | 5,759 |
| " " " 1919 .. .. .. .. | 256 .. | 6,370 |
| " " " 1920 .. .. .. .. | 172 .. | 6,695 |
| " " " 1921 .. .. .. .. | 246 .. | 5,745 |
| " " " 1922 .. .. .. .. | 340 .. | 17,897 |
| " " " 1923 .. .. .. .. | 220 .. | 12,857 |
| Period from 1st October, 1923 to 3rd February, 1924 | 136 .. | 7,271 |
| 2nd lactation, calf born 13th April, 1918 .. .. | 244 .. | 5,382 |
| 3rd " " 1st April, 1919 .. .. | 235 .. | 6,282 |
| 4th " " 3rd June, 1920 .. .. | 362 .. | 11,997 |
| 5th " " 22nd Oct., 1921 .. .. | 424 .. | 19,066 |
| 6th " " 13th May, 1923* .. .. | 273 .. | 18,960 |

As will be seen from these returns the cow gave little promise in her early years of being a big milker. At the time of inspection she was reported to be in splendid condition and perfectly healthy, and was expected to pass the 2,000 gallon mark. It is stated that the owner has four other cows from the same sire which have all averaged over 1,000 gallons with their last four calves.—"Agricultural Gazette" of N.S.W.

* This last yield was up to 3rd February, 1924, when she was still in milk and giving about 40 lb. per day.

### Export of Cotton—Southern Restrictions.

The Minister for Agriculture (Hon. W. N. Gillies) stated recently that he had received notification from the Director of Agriculture, Melbourne, to the effect that Victoria had prohibited the introduction into that State from the States of Western Australia and Queensland and from the Northern Territory all ginned or unginned cotton or of cotton seed, unless accompanied by a certificate from the Agricultural Department of the exporting State or Territory, that such cotton or seed had been treated, so as to destroy any hibernating larvæ of the Pink Boll Worm.

### The Renovation of a Lucerne Stand.

How best to treat a three-year-old stand of lucerne which showed signs of deterioration was the problem presented to the Department by a correspondent recently. The land might, in the writer's opinion, possibly be deficient in lime. Would it be advantageous, on the showing of the sample of soil submitted, to make an application of this constituent?

The correspondent was informed that the application of lime is not recommended, as the increased growth rarely warrants the cost. Lime usually costs about £5 per ton delivered on the farm, and it is unlikely that the increased yield will be sufficient to return a profit. In this case superphosphate could probably be applied with advantage at the rate of 1 cwt. per acre early in the spring. It can be spread over the lucerne on a calm day through the fertiliser attachment of the wheat drill, the tubes being removed so that the superphosphate will be well distributed. If the weather is windy it is better to use the tubes on the drill, so that the fertiliser may be conveyed to the ground.

It is not easy to injure established lucerne, and heavy cultivations may be given. One cultivation may be given in the spring after the superphosphate has been spread, and a further cultivation after each cutting. A disc cultivator can be used for the spring cultivation, but for the later cultivations it may be better to use a spike roller or springtooth cultivator.

It may be added that pamphlets on the top-dressing of lucerne and other aspects of the cultivation of this crop are among the many obtainable free by farmers on application to the Department.—A. H. E. McDonald, Chief Inspector of Agriculture, N.S.W.

### Protection of the Sugar Industry.

"The Queensland Ministry strongly supports the existing form of control which has been demonstrated by experience to afford the most effective protection to the sugar industry, and is equitable to the workers, farmers, and consumers," said the Premier (Hon. E. G. Theodore) on 15th July, when announcing that the Ministry had completed arrangements with the refining companies for the handling of the 1924 season sugar output. At the end of the present year the arrangement between the Commonwealth and the State expires. "Experience of twelve months' operations under the existing arrangement," continued Mr. Theodore, "satisfies me that a continuance is necessary for the welfare of the industry and Australia. I am satisfied that the existing arrangement, as a principle, is more advantageous to all concerned than simply tariff protection. The price of raw sugar on the world's market in February was approximately £30 a ton. To-day it is £17."

### Cheese Board.

The following is the result of the ballot for the election of members of the Cheese Board:—

| | |
|---|---|
| Henry Keefer (Pittsworth) | 611 |
| Henry Thomas Anderson (Biddeston) | 589 |
| Albert George Tilley (Rosehill) | 503 |
| Mads Peter Hansen (Malling) | 430 |
| David Gabriel O'Shea (Southbrook) | 391 |
| James McRoberts (Tiaro) | 386 |
| William Smith (Yangan) | 320 |
| John Lipp (Greenmount) | 302 |
| Robert Goodwin (Byrnestown) | 148 |

As five members only are required, Messrs. Keefer, Anderson, Tilley, Hansen, and O'Shea have been elected, and will be appointed as members for the ensuing twelve months.

It is interesting to note that Messrs. Keefer, Anderson, Tilley, and Hansen, who were the retiring members of the old Board, have been re-elected. Mr. D. G. O'Shea, of Southbrook, is the new member in the place of the late Mr. J. E. Dean.

**Staff Changes and Appointments.**

Constable E. H. Skipper, of Tangorin, has been appointed an Inspector of Slaughter-houses.

The following changes have been made in the recent appointments of Cane Testers to Sugar-mills for the 1924 sugar season:—

Mr. J. McFie, Cane Tester, Gin Gin Mill, to be Cane Tester, Marian Mill;

Miss A. E. Levy, Assistant to Cane Tester, Maryborough Mill, to be Cane Tester, Gin Gin Mill;

Miss I. McGill, Cane Tester, Invicta Mill, to be Cane Tester, Cattle Creek Mill;

Mr. C. H. Jorgensen, Cane Tester, Cattle Creek Mill, to be Cane Tester, Invicta Mill; and

Mr. H. B. Davis has been appointed Cane Tester at Rocky Point Sugar Mill.

Mr. C. O. O'Connor and Miss E. M. Boddington have been appointed Clerical Assistants to Cane Testers at Moreton and Maryborough Mills respectively.

Mr. A. R. Henry, Secretary of the Central Sugar Cane Prices Board, has been appointed to be Temporary Chairman of that Board on all occasions when the Chairman, Mr. Justice O'Sullivan, is absent.

**Cold Milk Pool.**

A notice has been gazetted advising the intention of the Government to create a Pool for Cold Milk produced in that portion of Queensland within a radius of 37 miles of the General Post Office, Brisbane, and which is delivered to any portion of Brisbane within a radius of 5 miles of the General Post Office. The pool, if formed, will only apply to cold milk; and the definition of "hot milk" is, milk delivered by dairymen direct to consumers within five hours after milking. The pool will be for the period of five years from the 1st September, 1924, and will apply to both milk and cream intended for consumption, but will not apply to milk intended for cheese or condensed milk, nor cream intended for butter manufacture. The Board to administer the pool will consist of five elected representatives of the growers, together with one person to represent the Council of Agriculture, one person to represent the Queensland Government, and one person to represent the Primary Producers' Bank of Australia, which is financing the pool. The Pool Board will hold office for one year and may acquire, establish, and carry on depôts for the cold storage of milk and cream, but not for butter and cheese, and the utilisation of surplus milk by its separation into cream or skim milk. The Board may provide for the financing of the cost of the establishing of depôts by levying not more than one penny per gallon on milk supplied to the Board for the first year, and one halfpenny thereafter. In the event of the local authorities within the 37-mile radius undertaking to provide for the milk supply for the metropolis, the pool organisation and property may be transferred to the local authorities subject to payment assessed by the Land Court. If the local authorities do not take over the pool organisation before the 1st March, 1929, provision is made for the pool's plant and assets to be handed over to a milk suppliers' co-operative association, and for the issue of debentures or shares to suppliers in proportion to the levies paid by them during the currency of the pool. The persons eligible to vote at any referendum or election in connection with the Board prior to the 1st November, 1924, shall be persons who at any time since the 1st January, 1923, supplied cold milk from within the 37-mile radius to any portion of Brisbane within a radius of 5 miles of the General Post Office. The persons entitled to vote on any subsequent referendum or election shall be persons who at any time during the six months prior to the date of such referendum or election carried on the business of cold milk suppliers. The pool will be subject to the provisions of the Health Acts and the Dairy Produce Act, and shall not sell

milk or cream at prices higher than those prevailing at the time of its creation without approval of the Minister. Provision is made for the pool to subsequently take in hot milk suppliers should they so desire. Any petition for a poll to decide whether the pool shall be created must reach the Minister before the 2nd September, 1924, and must be signed by at least fifty cold milk suppliers. To insure their names being on the roll of persons eligible to vote, dairy farmers who will be affected by the pool are invited to send their names and addresses to the Department of Agriculture and Stock at once. Nominations for membership on the Board will be received by the Under Secretary, Department of Agriculture and Stock, until the 23rd August, 1924. Each nomination must be signed by at least ten growers.

### The Crow as a Pest Destroyer.

The crow seems to be coming into his own at last, and his undoubted services are gradually gaining recognition, though he has suffered much for the sins of his cousin, the raven. Hitherto only a few bird-lovers have had a good word for the "black devil," the most unpopular of birds. One of the most pressing problems of the settler in any part of this country is the blowfly pest, which causes immense annual loss among sheep. The crow plays an important part in eradicating the blowfly and preventing the spread of disease by his predilection for rotting carcasses —the breeding ground of the pest—and for blowfly maggots. He also destroys vast quantities of other harmful insects, especially locusts (grasshoppers). But there is an important difference between the useful crow and the scoundrelly raven, though they are commonly confused. The raven is the larger bird, with a louder and hoarser voice, and has uniformally black feathers. The feathers on the back and neck of the crow are pure white at the base. It is the raven which steals eggs and chickens, raids newly-sown crops, and plucks out the eyes of living animals when they are helplessly weak in times of drought. But, on the whole, the less common crow is a useful bird in many districts, and should not be exterminated.—"Queenslander."

### Broom Corn Millet.

The Minister for Agriculture and Stock (Hon. W. N. Gillies) advises that a proclamation dated 26th June, 1924, has been received from the secretary to the Agricultural Ministers' Conference, Sydney, in which it is stated that, owing to the danger of introducing the European corn borer (*Pyrausta nubilalis*), the importation into Australia of broom corn millet is prohibited, unless on arrival it is subjected to steam disinfection.

### Beware of the Bull.

Every year, because of thoughtlessness or carelessness, some men are killed by bulls. And usually it is the safe bull that does the killing! Every man working with cattle should always remember that all bulls are dangerous, and that care and thought must be exercised in working about them. Always play safe in working with bulls. Always ring a bull when he is about one year old. For the first year use a small ring, and later put in a large one. Do not leave a small ring in a mature bull; it is unsafe. Always use a staff (the best is none too good) in handling a bull two years old or over—it is better than life insurance.—"Live Stock Journal."

### Rebate on Sugar.

Under the arrangement betwen the Commonwealth and State Governments, the rebate on sugar in exported products is fixed by a board designated the competent authority. The authority, comprising Mr. Justice O'Sullivan, chairman; Mr. J. Musgrave, Acting Collector of Customs, representing the Commonwealth; and Mr. G. H. Pritchard, representing the State, has met, and fixed the sugar export rebate, as from 1st July, at £10 13s. per ton on sugar contained in jam, canned fruit, preserves, and milk, and £12 per ton on sugar in other goods.

PLATE 47.—A GOOD STAND OF PLANT CANE AT GLASSHOUSE MOUNTAINS.
The variety is Q.813 and was planted by Mr. W. R. Day, Montcalm, and is showing seven months' growth. The height of the man in the picture is 5 ft. 8 in.

## SUCCESSFUL PIG RAISING.

The three outstanding features of successful pig raising are:—

1. Knowledge of the job, personal attention to all details of management, reliable breeding stock and a good farm.

2. Efficiency in all operations, keeping an ever watchful eye on the growth and development of each animal, studying carefully the costs of production.

3. Co-operation in developing the industry, in the production of all food supplies on the farm, in the marketing of the stock, and in uplifting the industry by co-operating with the Department of Agriculture and Stock in its efforts to keep disease out and to place the industry on a successful basis.

*Photo. Randolph Bedford.*]

Plate 48.—Crossing a Flooded Creek on Tobermory, Western Queensland.

## PLANT BREEDING IN RELATION TO COTTON.

Many persons imagine that all that need be done is to import sufficient seed of a good variety from America in order to plant our cotton area here, but this, unfortunately, is not possible in practice. In the first place all seed that is imported from America has to come from a source certified by the U.S.A. Department of Agriculture, must be fumigated, and, if possible, delinted with sulphuric acid. This, therefore, limits us to the importation of small quantities of seed since these quarantine precautions are absolutely necessary if we are to keep out exotic diseases and pests. Secondly, any variety which is newly imported shows what is known as "new place effect," *i.e.*, it is inclined to vary in staple, habit of growth, and other characters, and become uneven. This phenomenon is well known in other countries, and is probably caused by the variety making an effort to acclimatise itself to the new conditions. It has already been observed in the Durango variety which was imported into Queensland three years ago, and it has become abundantly obvious that we shall have to adopt careful methods of selection within this variety if we are to get types particularly suited to this country. Further, in such an extensive country as Australia, it is perfectly obvious that one variety will not suit all parts of the cotton belt, and we shall therefore have to breed cottons to suit particular localities.—G. Evans, Director of Cotton Culture.

*Photo. Randolph Bedford.*]

PLATE 49.—A GLIMPSE OF THE GARDEN, NORLEY, THARGOMINDAH. IRRIGATED FROM A BILLABONG ON THE BULLOO RIVER.

The garden is flooded fortnightly in winter and weekly in summer.

*Photo. Randolph Bedford.*]

PLATE 50.—A BANANA GROVE, NORLEY STATION, THARGOMINDAH, WESTERN QUEENSLAND.

## HOW AMERICA DISPOSES OF HER MAIZE CROP.

More than 80 per cent. of the United States maize crop is fed to livestock, and somewhat less than 10 per cent. is used for human food. The pig is the largest consumer, more than 40 per cent. being fed to pigs on the farms. Horses and cattle come next, using 20 to 15 per cent., respectively. The export of grain, as grain, has never been large. Queensland can do the same. Increased production of maize emphasises the importance of better pigs on every farm.

## AMERICA'S CONSUMPTION OF MEAT.

The estimated total quantity of meat consumed in the United States during the year 1923 was 18,481,000,000 lb. Of this amount the details are:—10,113,000,000 lb. pork; 6,918,000,000 lb. beef; 873,000,000 lb. veal; 574,000,000 lb. mutton and lamb; 3,000,000 lb. goat. This represents an increase of 2,000,000,000 lb. over the average of the last four years, with a *per capita* increase of about 18 lb.

## BACON FACTORIES OPERATING IN QUEENSLAND.

The bacon factories operating in Queensland are:—Queensland Co-operative Bacon Co. Ltd., Murarrie; Foggitt, Jones and Co., Ltd., Oxley; J. C. Hutton Pty., Ltd., Zillmere; Reeds Ltd., Maryborough; Darling Downs Co-operative Bacon Co. Ltd., Willowburn, *viâ* Toowoomba; Warwick Bacon Co., Mill Hill, Warwick; and North Queensland Co-operative Bacon Co., Floreat Siding, Mareeba, North Queensland.

The annual output of these combined factories represents, approximately, a total of £1,000,000. There is ample room for expansion; all these factories will willingly increase their capacity as soon as the increased number of pigs is available.

## THE IMPORTANCE OF PIG RAISING.

For the three months ended November, 1923, Great Britain imported 2,467,746 cwt. of bacon and hams, equal to 2,500,000 pigs. These were supplied by Denmark, 1,000,000; United States of America, 900,000; Canada, 300,000; and other countries, 300,000.

In other words, Great Britain in three months imported bacon equal to more than two and a-half times the total number of pigs in the Commonwealth of Australia. Queensland's share in these imports was nil. The opportunity offers for Queensland to enter the rank of exporters of hams and bacon to Great Britain and the wider fields in the East.

## A FINE MAIZE YIELD.

A return of 284 bags of prime maize has recently been threshed from a 9-acre paddock, the property of Councillor T. J. Howell, and grown by Mr. James Lamb, Killarney. Although the crop suffered from two set-backs in the earlier stages, it still yielded over thirty-one bags to the acre. This particular paddock has been cropped for more than twenty years, and never at any time has any fertiliser been used. Mr. Lamb grew a crop of thirty-three bags to the acre on the same paddock two years ago.

# Farm and Garden Notes for September.

With the advent of spring, cultivating implements play an important part in farming operations.

The increased warmth of soil and atmosphere is conducive to the growth of weeds of all kinds, particularly on those soils that have only received an indifferent preparation.

Potatoes planted during last month will have made their appearance above the soil, and where doubt exists as to their freedom from blight, they should be sprayed with either Burgundy or Bordeaux mixture as soon as the young leaves are clear of the soil surface.

Land which has received careful initial cultivation and has a sufficiency of subsurface moisture to permit of a satisfactory germination of seeds may be sown with maize, millets, panicum, sorghums, melons, pumpkins, cowpeas, broom millets, and crops of a like nature, provided, of course, that the areas sown are not usually subjected to late frosts.

Rhodes grass may be sown now over well-prepared surfaces of recently cleared forest lands or where early scrub burns have been obtained, and the seed is sown subsequent to showers. More rapid growths, however, are usually obtainable on areas dealt with, say, a month later.

In connection with the sowing of Rhodes grass, farmers are reminded that they have the Pure Seeds Act for their protection, and in Rhodes grass, perhaps more than any other grass, it is necessary that seed of good germination only should be sown. A sample forwarded to the Department of Agriculture will elicit the information free of cost as to whether it is worth sowing or not.

Where the conditions of rainfall are suited to its growth, paspalum may be sown this month.

The spring maize crop, always a risky one, requires to be sown on land which has received good initial cultivation and has reserves of soil moisture. Check-row seeding in this crop is to be recommended, permitting as it does right-angled and diagonal cultivation by horse implements, minimising the amount of weed growth, and at the same time obtaining a soil mulch that will, with the aid of light showers, assist to tide the plant over its critical period of "tasselling."

Although cotton may be sown this month, it usually stands a better chance if deferred until October. The harvesting of cotton during the normal rainy season is, if possible, to be avoided.

The sowing of intermediate crops prior to the preparation of land for lucerne sowing should be carried out in order that early and thorough cultivation can take place prior to the autumn sowing.

The following subsidiary crops may be sown during the month:—Tobacco and peanuts, plant sweet potatoes, arrowroot, sugar-cane, and cow cane (preferably the 90-stalked variety), and in those districts suited to their production yams and ginger. Plant out coffee.

KITCHEN GARDEN.—Now is the time when the kitchen garden will richly repay all the labour bestowed upon it, for it is the month for sowing many kinds of vegetables. If the soil is not naturally rich, make it so by a liberal application of stable manure and compost. Manure for the garden during summer should be in the liquid form for preference. Failing a sufficient supply of these, artificials may be used with good results. Dig or plough the ground deeply, and afterwards keep the surface in good tilth about the crops. Water early in the morning or late in the evening, and in the latter case, stir the soil early next day to prevent caking. Mulching with straw, leaves, or litter will be of great benefit as the season becomes hotter. It is a good thing to apply a little salt to newly-dug beds. What the action of salt is, is not exactly known, but when it is applied as a top dressing it tends to check rank growth. A little is excellent for cabbages, and especially for asparagus, but too much renders the soil sterile, and causes hardpan to form. French or kidney beans may now be sown in all parts of the State. The Lima bean delights in the hottest weather. Sow the dwarf kinds in drills 3 ft. apart and 18 in. between the plants, and the climbing sorts 6 ft. each way. Sow Guada bean, providing a trellis for it to climb on later. Sow cucumbers, melons, marrows, and squash at once. If they are troubled by the red beetle, spray with Paris green or London purple. In cool districts, peas and even some beetroot may be sown. Set out egg plants in rows 4 ft. apart. Plant out tomatoes 3½ ft. each way, and train them to a single stem, either on stakes, trellis, or wire netting. Plant out rosellas. Sow mustard and cress, spinach, lettuce, vegetable marrows, custard marrows, parsnips, carrots, chicory, eschalots, cabbage, radishes, kohl-rabi, &c. These will all prove satisfactory, provided the ground is well worked, kept clean, and that water, manure, and, where required, shade are provided.

# Orchard Notes for September.

## THE COASTAL DISTRICTS.

September is a busy month for the fruitgrowers in the coastal districts of this State, as the returns to be obtained from the orchards, vineyards, and plantations depend very largely on the trees, vines, and other fruits getting a good start now.

In the case of citrus orchards—especially in the Southern half of the State—it is certainly the most important month in the year, as the crop of fruit to be harvested during the following autumn and winter depends not only on the trees blossoming well but, what is of much more importance, that the blossoms mature properly and set a good crop of fruit.

This can only be brought about by keeping the trees healthy and in vigorous growth, as, if the trees are not in this condition, they do not possess the necessary strength to set their fruit, even though they may blossom profusely. The maintenance of the trees in a state of vigorous growth demands—first, that there is an adequate supply of moisture in the soil for the requirements of the tree; and, secondly, that there is an adequate supply of the essential plant-foods available in the soil.

With respect to the supply of moisture in the soil, this can only be secured by deep and systematic cultivation, excepting in seasons of good rainfall or where there is a supply of water for irrigation. As a rule, September is a more or less dry month, and when it is dry there is little chance of securing a good crop of fruit from a neglected orchard.

If the advice that was given in the Notes for August regarding the conservation of moisture in the soil has been carried out, all that is necessary is to keep the soil stirred frequently, so as to prevent the loss of moisture by surface evaporation. If the advice has been ignored, then no time should be lost, but the soil should be brought into a state of good tilth as quickly as possible.

Where there is a supply of water available for irrigation, the trees should receive a thorough soaking if they require it. Don't wait till the trees show signs of distress, but see that they are supplied with an adequate supply of moisture during the flowering and setting periods.

It is probable that one of the chief causes why navel oranges are frequently shy bearers in the coastal districts is that the trees, though they produce a heavy crop of blossoms, are unable to set their fruit, owing to a lack of sufficient moisture in the soil at that time, as during seasons when there is a good rainfall and the trees are in vigorous growth or where they are grown by irrigation, as a rule they bear much better crops. The importance of maintaining a good supply of moisture in the soil is thus recognised in the case of this particular variety of citrus fruit.

When the trees show the want of sufficient plant-food—a condition that is easily known by the colour of the foliage and their weakly growth—the orchard should be manured with a quick-acting, complete manure; such as a mixture of superphosphate, sulphate of ammonia, and sulphate of potash, the plant-foods in which are soluble in the water contained in the soil and are thus readily taken up by the feeding roots.

Although the above has been written mainly in respect to citrus orchards, it applies equally well to those in which other fruit trees are grown. Where the land has been prepared for bananas, planting should take place during the month. If the plantation is to be made on old land, then the soil should have been deeply ploughed and subsoiled and brought into a state of perfect tilth prior to planting. It should also receive a good dressing of a complete manure, so as to provide an ample supply of available plant-food. In the case of new land, which has, as a rule, been scrub that has been recently fallen and burnt off, the first operation is to dig the holes for the suckers at about 12 ft. apart each way. Good holes should be dug, and they should be deep enough to permit the top of the bulb or corm of the sucker to be 6 in. below the surface of the ground.

Take great care in the selection of the suckers, and see that they are free from beetle borers or other diseases.

As a precaution it is advisable to cut off all old roots and to dip the corms for two hours in a solution of corrosive sublimate, made by dissolving 1 oz. of this substance in 6 gallons of water.

In old banana plantations keep the ground well worked and free from weeds and remove all superfluous suckers.

Where necessary, manure—using a complete fertiliser rich in potash, nitrogen, and phosphoric acid, such as a mixture of meatworks manure and sulphate of potash, 4 of the former to 1 of the latter.

Pineapples can also be planted now. The ground should be thoroughly prepared —viz., brought into a state of perfect tilth to a depth of at least 1 ft.—more if possible—not scratched, as frequently happens; and when the soil requires feeding, it should be manured with a complete manure, which should, however, contain no superphosphate.

Old plantations should be kept in a good state of tilth and be manured with a complete fertiliser in which the phosphoric acid is in the form of bones, basic phosphate, or finely ground phosphatic rock, but on no account as superphosphate.

The pruning of custard apples should be carried out during the month, leaving the work, however, as late in the season as possible, as it is not advisable to encourage an early growth, which often means a production of infertile flowers. If the weather conditions are favourable, passion vines can also be pruned now, as if cut back hard they will make new growth that will bear an autumn crop of fruit instead of one ripening during the summer.

Grape vines will require careful attention from the time the buds start, and they should be regularly and systematically sprayed from then till the time the fruit is ready to colour with Bordeaux mixture, in order to prevent loss by downy mildew or anthracnose.

Where leaf-eating beetles, caterpillars, or other insects are present, the trees or plants on which they are feeding should be sprayd with arsenate of lead. All fruit-fly infested fruit must be gathered and destroyed and on no account be allowed to lie about on the ground, as, if the fly is allowed to breed unchecked at this time of the year, there is very little chance of keeping it in check later in the season.

## THE GRANITE BELT, SOUTHERN AND CENTRAL TABLELANDS.

Where not already completed, the winter spraying with lime-sulphur should be finished as early in the month as possible. Black aphis should be fought wherever it makes its appearance by spraying with a tobacco wash, such as black-leaf forty, as if these very destructive insects are kept well in hand the young growth of flowers, leaves, wood, and fruit will have a chance to develop. Woolly aphis should also be systematically fought wherever present, as once the trees are in leaf it is much more difficult to treat.

The working over of undesirable varieties of fruit trees can be continued. The pruning of grape vines should be done during the month, delaying the work as long as it is safe to do so, as the later the vines are pruned the less chance of their young growth being killed by late frosts. Keep the orchards well worked and free from weeds of all kinds, as the latter not only deplete the soil of moisture but also act as a harbour for many serious pests, such as the Rutherglen bug.

Grape vines should be swabbed with the sulphuric acid solution mentioned in the Notes for August, when the buds begin to swell, and just before they burst, as a protection against black spot and downy mildew.

New vineyards can be set out, and, in order to destroy any fungus spores that may be attached to the cuttings, it is a good plan to dip them in Bordeaux mixture before planting. The land for vines should be well and deeply worked, and the cutting should be planted with one eye only out of the ground and one eye at or near the surface of the ground.

In the warmer parts which are suitable for the growth of citrus fruits, the land must be kept well cultivated, and if the trees need irrigating they should be given a good soaking, to be followed by cultivation as soon as the land will carry a horse without packing.

In these parts fruit-fly should be systematically fought, as it will probably make its appearance in late citrus fruits and loquats; and if this crop of flies is destroyed, there will be every chance of the early crops of plums, peaches, and apricots escaping without much loss.

# ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S.

## TIMES OF SUNRISE AND SUNSET.

AT WARWICK.

| 1924. | JULY. | | AUGUST. | | SEPTEMBER | |
|---|---|---|---|---|---|---|
| Date. | Rises. | Sets. | Rises. | Sets. | Rises. | Sets. |
| 1 | 6·46 | 5 6 | 6·35 | 5·21 | 6·8 | 5·36 |
| 2 | 6·46 | 5·6 | 6·34 | 5·22 | 6·7 | 5·37 |
| 3 | 6·46 | 5·6 | 6·33 | 5·23 | 6 6 | 5·37 |
| 4 | 6·46 | 5 6 | 6 32 | 5·24 | 6·4 | 5 38 |
| 5 | 6·46 | 5·7 | 6·31 | 5 21 | 6·3 | 5·38 |
| 6 | 6·46 | 5·7 | 6·31 | 5·24 | 6·2 | 5·39 |
| 7 | 6·46 | 5 7 | 6·31 | 5·24 | 6·0 | 5·39 |
| 8 | 6·46 | 5·8 | 6·30 | 5·24 | 5·59 | 5·40 |
| 9 | 6·45 | 5·8 | 6·29 | 5·25 | 5·58 | 5·40 |
| 10 | 6 45 | 5·9 | 6 29 | 5 25 | 5·57 | 5·41 |
| 11 | 6·45 | 5·10 | 6·28 | 5 26 | 5 56 | 5 42 |
| 12 | 6 44 | 5·11 | 6 27 | 5·27 | 5·54 | 5·43 |
| 13 | 6·44 | 5·12 | 6 26 | 5 28 | 5·53 | 5·44 |
| 14 | 6·43 | 5·12 | 6·25 | 5·29 | 5·52 | 5 44 |
| 15 | 6·43 | 5 12 | 6 25 | 5·29 | 5·51 | 5·44 |
| 16 | 6 43 | 5·12 | 6 24 | 5·29 | 5 50 | 5·44 |
| 17 | 6·43 | 5·13 | 6 23 | 5·30 | 5·49 | 5·45 |
| 18 | 6·43 | 5·13 | 6·22 | 5·30 | 5·48 | 5·45 |
| 19 | 6·43 | 5·13 | 6·21 | 5·30 | 5·47 | 5·45 |
| 20 | 6·42 | 5·14 | 6·20 | 5·31 | 5·46 | 5·45 |
| 21 | 6·42 | 5·14 | 6 19 | 5·31 | 5·45 | 5·46 |
| 22 | 6·42 | 5·14 | 6·18 | 5·31 | 5·44 | 5 46 |
| 23 | 6·42 | 5·15 | 6·17 | 5·32 | 5·43 | 5·46 |
| 24 | 6·41 | 5·15 | 6·16 | 5·32 | 5·42 | 5·46 |
| 25 | 6·41 | 5·16 | 6 15 | 5·33 | 5·41 | 5·47 |
| 26 | 6·40 | 5·17 | 6·14 | 5·33 | 5·39 | 5·47 |
| 27 | 6·40 | 5·17 | 6·13 | 5·34 | 5·38 | 5·48 |
| 28 | 6·39 | 5·18 | 6 12 | 5·35 | 5·36 | 5·48 |
| 29 | 6·38 | 5·18 | 6·11 | 5·35 | 5·35 | 5·49 |
| 30 | 6·37 | 5·19 | 6·10 | 5·36 | 5·34 | 5·50 |
| 31 | 6·36 | 5·20 | 6·9 | 5·36 | ... | ... |

## Phases of the Moon, Occultations, &c.

The times stated are for Queensland, New South Wales, Victoria, and Tasmania, when "Summer" Time is not used.

| | | | |
|---|---|---|---|
| 2 July | ● | New Moon | 3 35 p.m. |
| 10 „ | ☾ | First Quarter | 7 46 a.m. |
| 16 „ | ○ | Full Moon | 9 49 p.m. |
| 24 „ | ☽ | Last Quarter | 2 35 a.m. |

Perigee 15th July, 8·6 a.m.

Apogee 27th July, 10·30 a.m.

Venus will be in inferior conjunction with the sun, that is between the earth and the sun, nearly in a straight line with the latter. On 1st July, 10 p.m., the moon being nearly new will be apparently in close proximity. On 3rd July, 11 p.m., the earth will be at its greatest distance from the sun. Mercury will be in superior conjunction with the sun, that is on the far side of its orbit at 4 a.m. on the 6th. Saturn will be in conjunction with the moon on the 10th, at 10·54 p.m., Saturn being about four times the diameter of the moon above it. Jupiter will be in conjunction with the moon, or about nine times the diameter above it near midnight on the 13th. On the 19th, 10·34 p.m., Mars will be in conjunction with the moon or about nine times its diameter above it.

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| | | | |
|---|---|---|---|
| 1 Aug. | ● | New Moon | 5 41 a.m. |
| 8 „ | ☾ | First Quarter | 1 41 p.m. |
| 15 „ | ○ | Full Moon | 6 19 a.m. |
| 22 „ | ☽ | Last Quarter | 7 10 p.m. |
| 30 „ | ● | New Moon | 6 36 p.m. |

Perigee 12th August, 5·54 a.m.

Apogee 24th August, 3·42 a.m.

There will be three eclipses this month. (1) A partial eclipse of the sun will not be observable in Queensland. It rises on the 1st and will be over at 7·4 a.m.; (2) a total eclipse of the moon between the hours of 5·31 and 7·9 a.m. on the 15th, visible in Queensland; (3) a partial eclipse of the sun on the 30th, commencing at 4·50 p.m., and continuing for more than two hours after sunset, but not visible in Australia.

Venus will be at its greatest brilliancy on the 7th; it will then become a morning star. The moon will pass below Jupiter on the 10th at 6 a.m. Mercury will be at its greatest elongation east of the sun on the 15th and will have become observable after sunset. The moon will pass Mars on the 16th, at 4·20 a.m. Mercury will be about 18 degrees (three times the length of the Southern Cross) to the south-east of Regulas on the 15th. On the 23rd, Mars will be in its best position for observation, being near its least distance from the earth and almost at its greatest brilliancy.

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| | | | |
|---|---|---|---|
| 5 Sept. | ☾ | First Quarter | 6 45 p.m. |
| 13 „ | ○ | Full Moon | 5 0 p.m. |
| 21 „ | ☽ | Last Quarter | 1 35 p.m. |
| 29 „ | ● | New Moon | 6 15 a.m. |

Perigee 7th September, 5 p.m.

Apogee 20th September, 10·54 p.m.

On the 23rd, at 6 a.m., the sun will be crossing the celestial equator on its way southwards, and the equinox will occur, the sun setting due west on the 23rd and rising due east on the 24th. Between 1 and 2 o'clock on the afternoon of 25th September the apparent proximity, to the naked eye, of the moon and Venus should form an interesting spectacle about half-way between the sun and the western horizon. Mercury will be at its greatest elongation W (nearly 18 degrees, or three times the length of the Southern Cross) on the 27th, at 7 p.m. The planets Venus and Neptune will be apparently very close to one another (about twice the diameter of the moon) on the 30th.

For places west of Warwick and nearly in the same latitude, 28 degrees 12 minutes S., add 4 minutes for each degree of longitude. For example, at Inglewood, add 4 minutes to the times given above for Warwick; at Goondiwindi, add 8 minutes; at St. George, 14 minutes; at Cunnamulla, 25 minutes; at Thargomindah, 33 minutes; and at Oontoo, 43 minutes.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]

## RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF JUNE, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING JUNE 1924 AND 1923, FOR COMPARISON.

| Divisions and Stations. | Average Rainfall. | | Total Rainfall. | |
|---|---|---|---|---|
| | June. | No. of Years' Records. | June, 1924. | June, 1923. |
| *North Coast.* | | | | |
| | In. | | In. | In |
| Atherton ... ... | 1·54 | 23 | 0·89 | 0·65 |
| Cairns ... ... | 2·82 | 42 | 2·37 | 1·36 |
| Cardwell ... ... | 2·06 | 52 | 1·80 | 2·04 |
| Cooktown ... ... | 2·00 | 48 | 3·37 | 0·37 |
| Herberton ... ... | 1·00 | 37 | 0·43 | 0·96 |
| Ingham ... ... | 2·42 | 32 | 1·20 | 2·24 |
| Innisfail ... .. | 6·98 | 43 | 8·26 | 2·15 |
| Mossman ... ... | 2·32 | 15 | 2·38 | 2·53 |
| Townsville ... ... | 1·27 | 53 | 0·90 | 2·43 |
| *Central Coast.* | | | | |
| Ayr ... ... ... | 1·35 | 37 | 1·63 | 3·93 |
| Bowen ... ... | 1·60 | 53 | 1·84 | 2·36 |
| Charters Towers .. | 1·31 | 42 | 0·21 | 1·77 |
| Mackay ... ... | 2·74 | 53 | 1·77 | 5·27 |
| Proserpine ... ... | 3·62 | 21 | 1·78 | 3·33 |
| St. Lawrence ... | 2·46 | 53 | 1·53 | 3·61 |
| *South Coast.* | | | | |
| Biggenden ... ... | 1·98 | 25 | 2·51 | 4·90 |
| Bundaberg ... ... | 2·73 | 41 | 0·79 | 4·10 |
| Brisbane ... ... | 2·67 | 73 | 4·80 | 2·66 |
| Childers ... ... | 2·27 | 29 | 1·30 | 4·27 |
| Crohamhurst ... | 4·09 | 30 | 3·30 | 2·89 |
| Esk ... ... ... | 2·05 | 37 | 3·14 | 2·53 |
| Gayndah ... ... | 1·89 | 53 | 1·14 | 3·39 |
| Gympie ... ... | 2·54 | 54 | 1·99 | 3·60 |
| Glasshouse Mts. ... | 3·86 | 16 | 2·91 | 2·70 |
| Kilkivan ... ... | 2·09 | 45 | 1·50 | 3·54 |
| Maryborough ... | 2·84 | 53 | 1·35 | 4·39 |

| Divisions and Stations. | Average Rainfall. | | Total Rainfall. | |
|---|---|---|---|---|
| | June. | No. of Years' Records. | June, 1924. | June, 1923. |
| *South Coast*—continued: | In. | | In. | In |
| Nambour ... ... | 3·35 | 28 | 1·85 | 3·12 |
| Nanango ... ... | 2·05 | 42 | 0·93 | 2·31 |
| Rockhampton ... | 2·11 | 37 | 3·08 | 3·91 |
| Woodford ... .. | 2·66 | 37 | 2·70 | 2·44 |
| *Darling Downs.* | | | | |
| Dalby ... ... | 1·71 | 54 | 1·52 | 2·21 |
| Emu Vale ... ... | 1·46 | 28 | 1·25 | 1·84 |
| Jimbour ... .. | 1·74 | 36 | 1·07 | 2·23 |
| Miles ... ... | 1·95 | 39 | 0·24 | 2·79 |
| Stanthorpe ... | 1·90 | 51 | 1·57 | 2·95 |
| Toowoomba ... | 2·36 | 52 | 1·24 | 2·83 |
| Warwick ... ... | 1·81 | 59 | 0·84 | 2·02 |
| *Maranoa.* | | | | |
| Roma ... ... | 1·74 | 50 | 0·25 | 2·70 |
| *State Farms, &c.* | | | | |
| Bungeworgorai .. | 1·87 | 10 | 0·23 | 2·74 |
| Gatton College ... | 1·75 | 25 | 2·88 | 2·37 |
| Gindie ... ... | 1·61 | 25 | 0·70 | 3·62 |
| Hermitage ... | 1·97 | 18 | 1·08 | 1·98 |
| Kairi ... ... | 1·32 | 10 | ... | 1·32 |
| Sugar Experiment Station, Mackay | 2·42 | 27 | 1·55 | 5·25 |
| Warren ... ... | 1·94 | 10 | 3·52 | 2·68 |

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for June, 1924, and for the same period of 1923, having been compiled from telegraphic reports, are subject to revision.

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